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THE TEACHING OF THE MEDICOSOCIAL ASPECTS OF CASES*

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THE older generation of today remember their early family doctor for his kindly manner, cheerfulness, understanding, sympathy and practical advice. They now realize that his knowledge of medicine was inadequate as judged by modern standards, but in retrospect at least, this seems relatively unimportant to them. His medical education was chiefly along practical lines, and if he was one of the more venerable men of that day, it had been acquired, aside from the study of anatomy, largely if not entirely through daily association with some older physician, in his buggy making visits, and in the hospital.

The age of Bernard, Virchow, Pasteur and Lister saw the dawn of modern research in clinical medicine, and the beginnings of applied science in its teaching. As a result, pathology, bacteriology, physiology and biological chemistry have been added to the older study of anatomy, and now form the basis of medical education. If considered in the light of advancement of knowledge this change has been altogether desirable, and its value has been unquestionably shown in new and improved methods of diagnosis, treatment and prevention of disease.

But the *practice* of medicine includes much more than an attempt to control disease by scientific methods. Eighty years ago James Jackson,[1] in his *Letters to a Young Physician,* said:

> From this day you must realize more and more the difference between the study of the sciences and the application of them to the business of life,—to the practice of your art. . . . First, because many principles, on which we act, are not established on certain ground; and therefore they must be followed with great caution and constant watchfulness. Second, because there are few principles which are universal in their application.

Later in the same letter he compares the art of medicine to that of navigation:

> In the practice of each of these arts we avail ourselves of the laws of nature to produce certain results. The seaman places his ship upon the waters, and avails himself of the winds to propel it. These winds are uncertain; they are not, in any way, subject to his control, so that he cannot be sure as to the duration, the comfort, or even the safety of the voyage; he cannot furnish a pupil with positive rules by which to conduct his bark across the Atlantic. The Captain must have regard to the qualities of his ship, the strength of his crew, and to the constantly varying circumstances of the weather. The complexity here is much less than attending the treatment of a disease; for in this we have to do with a living being.

Medicine is not, and never will be, an "exact science" which can be practiced by the precise methods of reasoning and deduction of the mathematician, the chemist or the physicist. The reaction, both mental and physical, of the human being to any external or internal factor is an ever-present variable which prevents the accurate and unfailing relation between cause and effect that characterizes the work of the true scientist. The engineer who wishes to construct a bridge that is to support a given weight can, through his knowledge of the strength of its component parts, prophesy with considerable accuracy the strength of the whole structure. The chemist can foretell the reaction that must result when two compounds are brought together under given conditions. But where living organisms are involved individual variation precludes any such exactitude, and in medicine the innumerable social, economic, psychiatric and physical elements of each situation make this variation an ever-changing factor in the reaction of the human being at various times in his life and even during the course of a brief illness.

Henderson,[2] in his most absorbing interpretation of Pareto's *General Sociology,* points out that many of the subjects taught in our universities may be divided into two classes: first, history, literature, economics, sociology, law, politics, theology, education, and so forth; second, logic, mathematics, physics, biology and other natural sciences, gram-

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mar, harmony, and so forth. He states that when the authorities on the latter group of studies disagree it is "most often at the frontiers of knowledge, where growth is taking place; and in the long run a debated question is ordinarily settled by observation, experiment, or some other method that all accept" — in other words, by the methods applicable to any true science. This, Henderson tells us, is not in general true of subjects of the first class, because "all of the subjects of the first class do involve, and no one of the subjects of second class does involve, the study of the interrelations of two or more persons."

If we attempt to place the study of medicine in one of these classes we at once see that it must be divided into its component parts. The basic sciences such as anatomy, physiology, chemistry and so forth unquestionably fall into the second group, but the *care of the patient* indubitably belongs in the first class, for one cannot treat the patient without regard to his social environment, and two or more people are involved.

A tendency to focus the emphasis in the modern teaching of medicine on the physical and laboratory approach to diagnosis, treatment and prevention of disease is liable to obscure the importance of those methods and qualities which enabled the old-fashioned family doctor not only to bring happiness, solace and mental tranquillity to his patients, but also, by his knowledge of them as individuals and as human beings, to discover and evaluate factors bearing a significant relation to their illnesses which would not have been revealed by the most complete modern laboratory studies or by the usual routine history and physical examination of today.

The clinical aspects of medicine are now taught principally in the public wards and outpatient departments of hospitals. This is necessarily so, and from the point of view of the study of disease the public hospital with its wealth of available clinical material is the best place for such teaching. But the difficulty is that in these surroundings the patient is likely to be stripped of his personality, his human relationships and the complexities of his own particular life and environment. The student, the intern and even the instructor tend to speak of him as a "case of gastric ulcer," for example, and to forget that he is a human being. As a result, they fail properly to investigate and consider the economic, occupational, social and psychological problems that he is facing, and that may have a direct or indirect bearing on the etiology and treatment of his illness.

Moreover, there is still a tendency to speak of all symptoms as either *functional* or *organic*, and to base their treatment upon this arbitrary method of classification. It is generally recognized that symptoms arise when some organ has a lesion and therefore functions abnormally. It seems to be realized by but few physicians that environmental factors often cause dysfunction of an organ or organs, and that dysfunction may result in a lesion. Yet there is much evidence that anxiety and nervousness may lead to gastric hyperacidity and eventually to gastric ulcer,[3] that exacerbations of arthritis frequently follow prolonged periods of mental or physical overactivity[4] and that arterial hypertension is found with significant frequency in the tense high-pressure type of individual.[5] Cobb[3] points out that certain diseases, such as paralysis agitans, formerly classified as functional are now known to show definite pathologic (cellular) changes, and are therefore organic. He prophesies that new or improved methods of investigation will demonstrate that other so-called functional ailments have pathologic changes and will be accepted as organic. These terms, therefore, are but arbitrary divisions of an indivisible field and should be avoided. Rather than attempt such a differentiation we should devote our attention to a consideration of the etiologic relation of environmental factors, symptomatology and physical and laboratory evidence of disordered function of the body as an organism, and realize that anything which happens to that organism is organic.

Frequently in a hospital the study of the environmental factors of the "case" is delegated to the social service department, but all too often it is entirely disregarded. Moreover, the function of the social worker is to act as a consultant who considers one particular portion of the patient's problem and renders an opinion on it to the physician in charge. One would scarcely expect the roentgenologist to make his studies of a patient without reporting his results to the physician; much less would one expect him to institute such treatment as seemed to him advisable without consulting the physician. Yet this is often the attitude taken toward the social worker. A summary of the social-service investigation and the recommendations resulting from it should be incorporated in the patient's record as routinely as are consultations from medical specialists such as the aurist, the roentgenologist and the gynecologist. It is in this way only that the various aspects of the patient's problem can be properly integrated by the physician in charge; yet it is seldom done.

The result of this basic defect in the hospital routine — this lack of proper liaison between the physician and the social worker — is further to hide from the student and the house officer the

importance of considering the social aspects of each case before drawing final conclusions as to its correct diagnosis and proper management. The individual whose medical experience has been confined to the study and care of the patients within the walls of a hospital, be he student, intern or visiting physician, is prone to look on the work of the social-service department largely as a charitable endeavor to better the lot of poor and uneducated patients. He thinks of social problems as being almost exclusively the result of financial distress. This is of course entirely erroneous, as similar and often more complex social problems arise in cases among the well-to-do. Aside from the assistance which the social workers give in arranging for the disposal of patients with chronic or incurable diseases, he sees very little correlation between their activities and his own. The student is not interested in the medicosocial aspects of the cases, chiefly because he does not appreciate their important relation to the etiology of symptoms, the practice of medicine and the prevention of illness.

The foregoing criticisms should not be construed as implying that attempts to teach the medicosocial approach to medical problems have not been made in the past, or are not included in the present curriculums of many medical schools. Edsall in 1912 introduced such teaching of students at the Massachusetts General Hospital.[6] Minot[7, 8] has stressed its value for many years. Many psychiatrists have been emphasizing its importance as a therapeutic procedure for a quarter of a century. And in the last few years instructors at various medical schools and in many fields of medical education — internists, psychiatrists, pediatricians, surgeons, teachers of preventive medicine, public health, and hygiene and social workers — have given lectures or special courses to medical students on this aspect of medicine. But despite these attempts of individuals, the fact remains that the social approach to the study of medical cases has received insufficient emphasis as a whole in the education of medical students, and has been totally neglected by many clinical instructors. The need is to permeate the entire curriculum with such teaching, rather than to confine it to any single department or teacher.

Objectives

It would therefore seem most desirable to bring about a change in the usual approach to the clinical teaching of medicine. We should attempt to develop in our students a greater interest in the patient as a human being, and should therefore avoid discussing his problems largely as phenomena of diseased organs or disordered function. We should adopt a more humane rather than a purely material attitude toward the problem of the individual. We should return to a greater emphasis on the *health* and *happiness* of the patient as the primary aim of medical practice, but not at the expense of minimizing the importance of the control or cure of disease. In all contacts with students we should keep in mind the following objectives: to develop in their minds a consciousness of the importance of the social aspects of medicine to the practice of their art; to bring to them a realization of their responsibilities as physicians, not only to the patient, but to his family, the community and humanity; to teach them how to elicit and evaluate in scientific fashion the social factors of the individual case; and to demonstrate how to construct a plan of treatment that is socially as well as medically adequate and applicable to the peculiar circumstances of the individual patient.

Importance of Social Aspects

The value of social study in diagnosis, the essential part that it plays in determining the exact treatment of the case and its role in the prevention of disease and of psychological maladjustments, both for the patient and for his associates in life, must be demonstrated to the student. He must be made to see clearly that this is an integral part of medicine itself, not merely an allied field of social endeavor. He must be reminded of the historical fact that social-service departments were created in public hospitals because this aspect of the cases of indigent patients was of necessity being neglected by busy physicians, but that these departments represent merely a dissemination of the function of the physician. The study and evaluation of the social component of each medical problem is, moreover, a duty which the physician has to assume unaided in dealing with his private patients. If the student can be made to realize this fully, he will be much more willing to learn the technic of social study and of its application.

Realization of Responsibilities

In discussions of the social aspects of medicine with students one is frequently asked such questions as these: Is it the physician's duty to go into family affairs so remotely connected with the patient's disease? Does not his responsibility end with the treatment of that disease, or at most of the patient himself? Does not this belong to the field of preventive medicine, or psychiatry, or a social-welfare agency? In order to answer these questions satisfactorily it is necessary to give the student a panoramic view of the whole field of

medicine. At one end of the picture we have the chemist, the bacteriologist and the physiologist, studying problems concerning disease, and working entirely in the laboratory. Next comes the trained clinical investigator. Near him stands the public-health officer, striving by experimental and practical methods to prevent and control disease in the community. In the middle we have the more strictly limited aspects of practice, the specialists who attack the patient's problem from but one point of view. They diagnose and treat ailments in their own particular field. They have methods and weapons especially adapted to their use — the surgeon's knife, the cardiologist's stethoscope and electrocardiograph, the laryngologist's head-mirror and bronchoscope, and so forth. At the other end of the panorama we have the psychoanalyst, who deals exclusively with the abnormalities of intellect and the emotions — the field so stupidly and incorrectly described as functional disorders. His work, at the extreme edge of the picture, touches that of the father confessor and spiritual adviser, the philosopher and the sociologist. And to him a complete knowledge of the social environment — in the broadest sense of the word — of his patient is essential.

But the picture is not divided into clear-cut sections or groups. The work of each touches that of all the others. Certain of the methods and discoveries of the pure scientist are applicable to each of the specialties. Every human being has his own psychological peculiarities. And throughout the whole panorama we have the internist, or to use the older and more descriptive term, the general practitioner. His functions are many. He serves as liaison officer between all the other groups. He is the jack-of-all-trades who does the jobs that do not fall directly into the other fields. He is himself a specialist in medical ailments. He often acts as a clearing house by directing patients to the specialists appropriate to their needs. His work carries him from one end of the panorama to the other, and to fulfill his function he must be acquainted with and occasionally take an active role in the work of each group. Moreover, every one of these individuals is dealing with human beings, each with his own peculiar life, environment and extramedical problems. If we accept the hypothesis that the practice of medicine involves the study of the interrelations of two or more persons, we must admit that each of these workers must consider the social aspects of every case that he cares for. The cardiologist has not helped his patient when he advises a sedentary life or "light work" to an individual who has a family to support and whose only means of livelihood is moving furniture. If, through his knowledge of the patient's talents, through the aid of social agencies or by any other means the cardiologist finds or suggests some employment for the patient that is compatible with his physical limitations, he has more fully performed his function as a physician. In so doing he has not only aided the patient, but also his family and the community, which would otherwise have been obliged to care for them all. Such considerations as these, with simple illustrations from actual cases, should enable us to convince the student of the scope of his responsibility as a physician and his duty to society as well as to the individual. He will then see that it is a part of the duty of every physician, whether he be a specialist or not, to act at times as a public-health officer, at others as a psychiatrist, and to try to prevent disease as well as to cure it. And he will realize that he must often become involved in social situations apparently remote from his patient's disease in order to assist in the control or cure of that disease.

The Elicitation and Evaluation of Social Factors

The term "environment" includes, in its social sense, not only geographical surroundings but social relations, — contacts with other individuals, — indeed all the factors which have an influence on the individual's reaction to life. Every human being has his own peculiar environment; therefore every medical case has its social aspects. The evaluation of the social data in relation to the patient's ailments depends first of all on the physician's ability to elicit the story. The student must be made to realize that the usual brief summary of the social, marital, economic and occupational history found in hospital records is entirely inadequate. A knowledge of the patient's ambitions, hobbies and interests, of his daily contacts and his reactions to them, should be acquired, and his moods, his thinking processes, his understanding of his illness and his ability to adjust to the handicaps which it imposes should be evaluated. The physician must know, in short, the intimate details of the patient's personality and his environment, and in order to acquire this knowledge he must gain the patient's confidence. The experienced physician or social worker seldom expects to gain all this data at the first visit, and if the patient is acutely ill little or none of it can be elicited from him. Much of the history may be learned from interviews with friends, business associates and members of the family. Indeed, even brief conversations with his daily companions may reveal in these individuals themselves factors deeply affecting the patient's psychological environment. The wife, in telling you of her

husband's symptoms, may reveal traits of her character that are pertinent to the situation. The manner in which his partner inquires about him over the telephone, or simply the dissolute appearance of the son whom you meet on the stairs or glimpse at a late breakfast, may give significant clues to problems and complexities in the patient's life.

In this study of the environment one is greatly handicapped if the patient is seen only in the physician's office or the hospital. Often, in private practice, it is desirable to seek deliberately an excuse to see the patient in his home surroundings, or to have an interview with him in his business environment. Although this is seldom possible to arrange for the student, its significance should be impressed upon him.

The value of these factors in the treatment of a sick person cannot be overemphasized. I[9] alluded to the importance of their consideration in a communication a few years ago, and much further thought on the subject has only served to strengthen my convictions. In this age of mechanization and laboratory investigation, with its ever-increasing number of tests and diagnostic procedures, we are all too prone to forget the importance of treating the patient as a whole man, as "he" or "she" rather than as a "case."

The mere acquiring of social data is not sufficient. Their evaluation in relation to the patient's illness requires the ability to see his problems from his point of view, rather than to judge of their significance by our own standards. The workingman's tenement may seem squalid to us, but entirely adequate to him. An illness which to us is trivial may fill him with terror and desperation. On the other hand, apparent success in any field of endeavor may be far short of the patient's aims, or his ambition may lie in an entirely different direction. For example:

In the case of the youthful president of a large and prosperous business concern, it was learned that he had always wanted to go into a profession, but that he had been forced by family considerations to go into the business in conducting which his father, the former president, had committed a crime and became a fugitive from justice. There was friction and jealousy among his board of directors, all of whom were older men who resented his succeeding his father. As a result, the patient had developed a deep sense of frustration and failure. This, on proper evaluation, proved to be the sole cause of the symptoms which at first seemed to point strongly to the diagnosis of peptic ulcer.

In order to decide what role such factors play in any case we must gain a thorough insight into the patient's reaction to his environment, and not be misled by a few superficial evidences of social, marital or economic prosperity. The eliciting of the social history demands tact, patience and keen perception. Its evaluation requires imagination, experience and the ability to see the problems through the patient's eyes.

Development of a Socially and Medically Adequate Plan of Treatment

The weakest [illegible]t in the program of treatment in a public h[illegible]cal usually develops at the time of the patie[illegible] discharge. Prior to then he has been the su[illegible]ject of detailed study and care by experienced clinicians, able clinical investigators and enthusiastic and watchful interns. He has had the benefit of the combined knowledge of many members of the staff of the hospital. But the planning of aftercare and his instruction in it are usually left largely or entirely to a house officer whose medical experience has been limited to hospital work, who has had no opportunity to study the problems of convalescence in the home and whose supervision of patients while at work has been confined to a few months in the outpatient department.

The first step in the planning of aftercare is to give the patient or his family as thorough as possible an understanding of his illness, its resulting limitations, their probable duration and their implications in regard to his future life and activity. Obviously the psychological effect of such information must be considered, and it is frequently advisable to pass much of this information on to relatives rather than to the patient. It must be remembered, however, that the patient is the one who must make the adjustment and carry out the instructions, and that therefore he must be given as complete an understanding of his situation and the reasons for each limitation as is consistent with his psychological welfare and happiness.

An intelligent police officer who had been on the ward for many weeks slowly recuperating from a severe coronary thrombosis was about to be discharged; the intern reported that the patient had been given a thorough understanding of the nature of his condition, its implications and limitations, that he had already arranged to be retired from the police force and that his future course of convalescence had been carefully planned for him. Partly for the purpose of demonstrating to the students the details of such planning, and partly to elicit personally the patient's reaction to his limitations, the visiting physician asked the patient what he was going to do when he went home that afternoon. "Put the wife and kids in the back of the car and start for California. We ought to make two hundred miles before dark," was the surprising answer. Further questioning revealed a complete lack of understanding of the situation not only by the patient but by the intern as well. The latter, apparently assuming that all policemen are patrolmen, had informed the patient that his work was not compatible with the degree of cardiac damage he had suffered, that he should resign from the force and spend the next few months "sitting

around outdoors." The patient, having been a sergeant attached to police headquarters, whose duties were almost entirely clerical, had interpreted this as implying that his sedentary life had been the cause of his illness, and that an outdoor life was advisable. To his mind driving an automobile eight or ten hours a day was a pleasant way of "sitting around outdoors," and he had been busily mapping out a tour that would include every state in the Union. With proper social planning his retirement was changed to a temporary leave of absence; his convalescence was completed at home, and he was then able to return to his previous duties with only slight modifications. In this case the intern, through lack of attention to detail, had entirely failed to acquire for himself, or to give the patient, an understanding of the medicosocial situation, and had thus allowed the patient to develop for himself a most undesirable program of aftercare. The revelation of his failure did much to make the house officer appreciate the importance of careful instruction to patients on discharge.

Another point to be remembered in drawing up a plan of treatment is that it is often important to consider the health and happiness of the patient rather than the prolongation of his life.

An elderly lawyer with hypertension and some anginal pain was told by an enthusiastic young physician that he must give up all use of tobacco and alcohol, retire from business and stop playing golf. The patient, feeling that these orders forbade the very things that made life worth living, decided after mature deliberation to defy them all. He smoked and drank distinctly more than had been his habit, worked harder and played harder. The result, as may be supposed, was severe and frequent attacks of pain, which he tried unsuccessfully to disregard. After a few weeks he consulted another physician, who, without knowing of the previous advice, counseled moderation in all things: "Continue to have your cigar after lunch and two in the evening, but cut down on the cigarettes that you really don't care for anyway. A highball in the evening will do no harm, but avoid cocktails when you can. At sixty-eight you should try to delegate as much work to others as possible, and take at least two afternoons away from the office each week. If you will give up the next six weeks to getting rested, on a definite regime, you will be able to carry on a fairly normal life afterward. There is only one rule which you must promise to obey: Whenever you have an attack of pain stop whatever you are doing and sit down, even if it is on a curbstone, until the pain goes away. You are going to be able to enjoy a good many more years if you will take reasonable care of yourself." The patient joyfully accepted this regime, and today at the age of eighty-four is alive, happy and in reasonably good health.

Finally, it is often more important for the plan of treatment to be practical for the patient and his family, and compatible with his financial and occupational resources, than for it to be the ideal therapy for his disease. The office worker may be unable or unwilling to take milk and cream every hour, but can perhaps arrange for a bland diet, regular meal hours and repeated brief periods of relaxation, which are often quite as effective in the treatment of peptic ulcer. A wage-earner with diabetes may not be able to give up time to enter a hospital for regulation of his disease, or be willing or able to weigh his food, but such individuals can, more frequently than is often realized, be treated successfully while at work, and can learn to estimate the composition of food intake with sufficient accuracy to permit satisfactory insulin therapy.

Methods

A study of the methods of teaching of the social component of medicine that have been employed, or are now in use throughout this country, reveals wide variations in both the character of the teaching personnel and the approach to the subject. The instruction is conducted by many different departments of the various medical schools, and in some by social workers without the aid of physicians. It is attempted variously by lectures, medicosocial ward rounds, case studies, case presentations, conferences and in some instances visits to the home. It seems obvious that one should not attempt to decide which of these means to a common end is the best. Each has its own advantages, and in all probability all are largely successful in accomplishing their purpose. The type of individual available for such teaching in each medical school and hospital will govern the selection of instructors, and the method of teaching will depend on the peculiar abilities of the individual and the exigencies of the situation at that particular medical center. The essential thing is to present to the student the medical approach to his cases in the most effective way that is possible.

Much deliberation on the various methods employed in other clinics, together with personal experiences at the Harvard Medical School unit of the Boston City Hospital, has, however, led to the formation of certain general conclusions:

That the teaching of the medicosocial aspects of cases is most effective if conducted by a physician rather than by a social worker alone.

That the function of the social worker in such teaching should be subsidiary to, though in close association with, that of the clinician.

That the case method of presentation, whether on ward rounds, in outpatient departments or in conference, is more suited to this teaching than didactic lectures alone.

That the subject should not be introduced as a separate entity, but in close correlation with the purely medical aspects of a disease or a case.

That the ultimate aim is to have such teaching permeate the whole medical curriculum, in all discussions with students that deal with diagnosis, prognosis and the treatment and prevention of illness.

Summary

The need for the teaching of the medicosocial aspects of cases is emphasized, the objectives of such teaching are outlined and discussed, and cer-

tain general conclusions as to the methods of teaching are presented.

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THYROID SURGERY AT A LARGE MUNICIPAL HOSPITAL*

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THIS report covers a series of 559 consecutive cases of thyroid disease treated surgicallv at the Boston City Hospital from 1925 to 1937, inclusive. Many patients entering a municipal hospital are at the end of their physical and economic rope. Because of this, and because of administrative problems not encountered in private institutions, special measures must be adopted in order to obtain satisfactory results. During the years covered by this series, no patient has been denied his chance for health by operation.

Prior to 1925 only occasional thyroid operations were done in the hospital. Because of unstandardized treatment many of the results were unsatisfactory, and the belief arose that thyroid surgery in this type of hospital was unsafe. Encouraged by two of our medical colleagues, Dr. Burton E. Hamilton and Dr. W. Richard Ohler, we began an attempt to organize thyroid surgery in the hospital.

In the beginning, thyroid cases were not assigned to me, but were obtained because of a demonstrated interest in them. The early cases were mostly poor risks and the mortality was high. Iodine had not been long in use, and frequent multiple-stage operations were necessary. Many patients refused operation. The interns were entirely inexperienced in the operative technic and postoperative care of thyroid patients. Patients were in thirty-bed wards and there was no way of isolating them. At this period the hospital itself was in the process of reconstruction. Wards were being torn down and new buildings being erected. The machine-gun rattle of pneumatic riveters did not make for a satisfactory convalescence. An anesthesia service did not exist. Each new anesthetist had to acquire experience with thyroid patients, and the apparatus then in use was difficult to manage.

After a time we were able to demonstrate the wisdom of assigning these patients to one surgeon. The staff generously did so on the basis of an annual assignment and subsequently made this permanent. The number of patients has steadily increased. The assignment of cases to one surgical service has meant a sacrifice by the other members of the staff, but it has benefited the patients. If the cases were rotated, in a staff of forty members no one surgeon could acquire enough experience to justify his doing thyroid operations. The new system has also made possible a thorough training of one group of interns, and operating is now being done by other surgeons on the service.

In 1932 a Thyroid Clinic was established in the Out-Patient Department. This is a diagnostic and follow-up clinic open one day a week. Its personnel includes both physicians and surgeons. It has been a very valuable part of the organization. In 1933 the Trustees made it possible to isolate female patients in semi-private rooms. Men had to be cared for in a large ward until 1938, when the opening of the new Dowling Building did away with this difficulty.

PREOPERATIVE CARE

Very few thyroid patients are admitted directly to the Second Surgical Service. Admissions to the hospital are either from the Out-Patient Department, in which case they have been studied in the Thyroid Clinic, or from the patient's family physician. Only non-toxic patients are referred directly from the Thyroid Clinic to the surgical service. All other thyroid patients are admitted to a medical ward for preliminary study, and soon after admission the surgeon is requested to see the patient in consultation. Meantime the patient is at rest, and study of the metabolic rate and blood chemistry is being done and existing complications, if any, are being treated. This preliminary survey by the surgeon is extremely valuable. It enables him to estimate more correctly the degree of toxicity than would be possible after the admin-

*Read at the annual meeting of the New England Surgical Society, Boston, October 1, 1938.

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istration of iodine. Unfortunately, a large percentage of patients are given iodine at home regardless of the type of pathologic lesion, and this not only makes the diagnosis more difficult but occasionally does positive harm. In 1 patient with a non-toxic adenoma active toxicity was induced by the taking of iodine.

Our custom has been to give iodine to all toxic patients. Those with hyperplasia are benefited. Certain of the nodular group apparently do not obtain a remission, but in our experience none have been harmed. The patients are seen again by the surgeon after medical treatment, and if ready for operation they are then transferred to the surgical service. In uncomplicated cases, patients usually obtain maximum remission following iodine therapy in seven to ten days.

PRELIMINARY MEDICATION

The night before operation the patient may be apprehensive. Some form of sedative is indicated. At present we give 1½ to 3 gr. of Pentobarbital. Under the existing organization a member of the anesthesia service sees the patient and issues this order and the one for the next morning, which usually calls for Pentobarbital two hours before operation and morphine and scopolamine one hour later, the doses depending on the case. Most patients arrive at the operating room drowsy, some are sound asleep, and a few remember nothing until late in the afternoon after the operation.

ANESTHESIA

With the exception of a few operations under novocain anesthesia, the entire series has been done with nitrous oxide and oxygen. In the early years this was reinforced by two preliminary doses of morphine and scopolamine. For a short time Avertin was tried as a basal anesthetic, supplemented by nitrous oxide and oxygen. Our present routine seems satisfactory, particularly since the adoption of more up-to-date anesthesia machines containing carbon-dioxide filters.

In our former operating rooms the use of ethylene and cyclopropane was unsafe because of the danger of explosion. Since the opening of our present operating suite in June, 1938, the Trustees have granted us permission to use cyclopropane. From experience in other hospitals we believe this to be the most satisfactory agent at present, since with this gas it is possible to use a very high percentage of oxygen and still get good relaxation. Intratracheal anesthesia has been used in some of the intrathoracic goiters where there was tracheal deviation or narrowing.

During the operation the anesthetist keeps a record of the blood pressure, pulse and respiration. If at any time the condition becomes alarming it is his duty to notify the surgeon. The anesthetist has the power of final decision as to whether or not the operation shall be completed in one or two stages.

A few patients in our series were fully awake on reaching the operating room despite their premedication, and could not be controlled with nitrous oxide and oxygen. We never hesitate to return such patients to the ward and schedule them for another day, with heavier premedication. This is a much wiser procedure than operating on a highly excitable patient. Poor relaxation increases the technical difficulties, and patients in this excitable state do not do well postoperatively.

OPERATION

After anesthesia is begun the patient's neck is hyperextended, the skin prepared and the field draped. The line of incision is injected with a 1 per cent solution of novocain. A collar incision is made 2 or 3 cm. above the sternal end of the clavicle, its width varying with the size of the goiter and the length of the neck. The skin and platysma muscle are divided, and as one layer the flap is dissected upward to the top of the thyroid cartilage and the lower flap is freed downward. All bleeding points are clamped and tied. At this stage the edge of the upper flap is grasped with a tenaculum and is held by an assistant.

The fascia is next divided vertically from the thyroid cartilage to the suprasternal notch between the edges of the sternothyroid muscles. The ribbon muscles are freed from the surgical capsule by blunt dissection and retracted laterally. In the early years of this series these muscles were cut across, but for some years this has not been done except in special cases where a wider exposure was necessary. We believe that division of the muscles predisposes to complications and tends to cause deformity of the neck.

Before dislocating the lobe forward and mesially it is important to clamp and tie the middle thyroid veins. If this is not done troublesome and uncontrollable bleeding may result. The lobe can then be grasped with hooks, rotated, and the areolar tissue and muscle stripped from the posterolateral surface of the gland. Downward traction with the index finger inside the capsule and sweeping about the upper pole will usually bring the latter forward into the wound. The pole may be ligated at once or double-clamped, leaving a small bit of gland. After resection the pole is transfixed by a suture and anchored to the tissues covering the lateral wall of the thyroid cartilage. This prevents retraction of the branches of the superior thyroid artery.

Next the suspensory ligament is divided, and also the pyramidal lobe, if present. The isthmus is divided and the lobe resected from within outward, making traction outward, with the index finger held behind the lobe to control bleeding. Very little of the trachea should be exposed, and a definite attempt to preserve a strip of the posteromesial surface of the lobe must be made so as to protect the recurrent laryngeal nerves and the inferior group of parathyroids. On the outer surface of the lobe the true capsule may be divided at a slightly higher level. This aids in reconstructing the lobe after resection.

The type of gland and the degree of toxicity determine the amount to be resected. This varies from two thirds to seven eighths of the total. Patients are restored to physiologic function with very little thyroid tissue remaining. Comparatively few become myxedematous, and these are readily controlled by thyroid extract. It seems preferable to risk this possibility rather than a persisting toxicity due to insufficient removal. Our tendency before experience taught otherwise was to do inadequate resections.

At this point in the operation all clamped bleeding points should be tied. More and more we have practiced ligating the inferior thyroid artery on one or both sides, until now it is an almost routine step. This is done close to the carotid artery after division of the deep cervical fascia. In no case have we found any resultant dysfunction. The outer capsule of the resected lobe is then turned toward the median line and the reconstruction of the lobe is completed by continuous or mattress sutures. The opposite lobe is treated similarly. A small rubber drain is inserted to the bed of the wound and the ribbon muscles are closed with interrupted sutures. Formerly ties and sutures were of catgut. For the past year fine silk has been used for ties and slightly heavier silk for sutures. There seems to be definitely less reaction from silk, and there is less postoperative accumulation of serum in the wound.

The neck is then slightly flexed and the skin flap is replaced with Michel clips. It is unnecessary to suture the platysma separately. The use of clips results in excellent scars. We remove half the clips and the drain in twenty-four hours, and the remainder in forty-eight hours. If they remain longer small areas of necrosis develop beneath the points of the clips and the scar is not satisfactory.

In patients with a discrete single adenoma we have been satisfied with enucleating the adenoma or doing partial lobectomy. In toxic adenomas with hyperplasia a subtotal thyroidectomy is indicated. Where adenomas exist it is well to remove all pathologic tissue. This may amount to a subtotal thyroidectomy, but even in non-toxic patients sufficient normal thyroid usually remains to maintain the metabolic level.

POSTOPERATIVE CARE

The patient is accompanied to the ward by an intern, who sees that the proper orders are recorded. Good nursing at this stage is invaluable. The fact that the head nurses on the service have acquired considerable experience with thyroid patients has made our problem much simpler.

Since quiet is essential, isolation has been practiced so far as possible. Morphine and other sedatives are not given by the clock, but only as needed to prevent restlessness. Fluids are given by mouth, since nausea is not prolonged and a great deal of liquid can be absorbed in spite of nausea and vomiting. Fluids containing Lugol's solution are also given by rectum for twelve hours. Intravenous glucose solution is given in the sicker patients, occasionally with the addition of Lugol's solution. A semi-solid diet is given the day following operation, and increased to full diet by the second or third day.

Most patients are co-operative. This is partly due to the fact that the surgeon has seen the patient before operation, and has advised him in advance what to expect in the way of postoperative discomfort and routine care.

The temperature is normally elevated to about 100°F. following operation. Both pulse and temperature tend to reach normal about the third day. As soon as this occurs we allow patients with uncomplicated cases to stay out of bed for short periods, but do not urge them to do so. The average day of discharge is the seventh. Dressings are simple. If serum accumulates in the wound it is released with a fine probe. Healing takes place promptly. After discharge, patients return to the service for dressings and are referred to the Thyroid Clinic for further checkups.

ANALYSIS OF RESULTS

The distribution of cases in recognized pathological groups is given in Table 1. Women outnumbered men 6:1. The total number of toxic cases — nodular, diffuse and recurrent — is 374. The number of toxic nodular cases, 78 (22.8 per cent) of 342 primary cases, is considerably higher than that found in other reported series. Also this group usually has a mortality approximately twice that of the diffuse group. We are unable to account for this variation. The classification as nodular is based on pathological reports of adenoma with evidences of hyperplasia. The diffuse cases

also have been classified on the basis of pathological findings.

The mortality figures for the period 1925-1937 are reported in Table 2. From 1925 to 1929 the mortality of toxic cases was 12 per cent, or 6 deaths in 50 cases. Twenty-four of these are classified as bad risks according to the criteria given below. In this period there were 18 two-stage operations and 4 preliminary pole ligations. In all probability these patients, with 4 exceptions, would have two-stage operations today because of the severity of their disease.

Nine of these 50 patients, or 18 per cent, had cardiac manifestations; 3 had evidences of beginning failure before operation, while 4 were psychotic preoperatively. There were 2 cases of diabetes, one so severe that the patient went into coma twice before operation and showed sugar while getting 90 units of insulin a day. Another patient had severe myasthenia gravis complicating her hyperthyroidism, and died of respiratory failure. One of the patients with cardiac decompensation, fifty-four years of age, suffered in addition from bronchiectasis, and her goiter was substernal. One patient was four months pregnant, with toxic symptoms and severe vomiting which cleared up after thyroidectomy. One patient died on the operating table before the completion of a hemithyroidectomy, a respiratory death which we attribute to the anesthesia. Two of the 3 thyroid storms occurred in 1926. Two other patients in the early group died of cardiac failure. This analysis shows that the mortality in the early period was due largely to the predominance of patients who were poor risks.

Table 1. *Distribution of Cases of Thyroid Disease Classified According to Lesion.*

TYPE OF LESION			NO. OF CASES
Goiter			543
Toxic		374	
Nodular	78		
Diffuse	264		
Diffuse recurrent	32		
Non-toxic		169	
Nodular	155		
Diffuse	14		
Thyroiditis			10
Acute		5	
Chronic		5	
Carcinoma of thyroid			5
Aberrant thyroid			1
Total			559

Table 2. *Mortality Rates in Goiter Cases, 1925-1937.*

TYPE OF LESION	NO. OF CASES	NO. OF DEATHS	PERCENTAGE MORTALITY
Goiter	543	14	2.6
Toxic	374	12	3.2
Nodular	78	1	1.3
Diffuse (including recurrent)	296	11	3.7
Non-toxic	169	2	1.2
Nodular	155	2	1.3
Diffuse	14	0	—

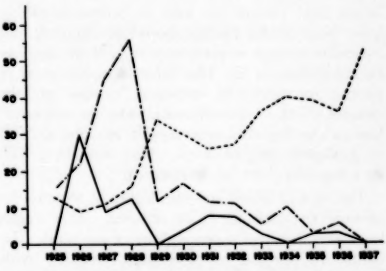

Figure 1. *Analysis of Toxic Thyroid Cases Operated on at the Boston City Hospital, 1925-1937.*

The dotted line represents the number of cases; the dot and dash line, the percentage of operations performed in stages; the solid line, the mortality rate.

The mortality rates from 1929 to 1937, shown in Table 3, represent a fairer average than do the figures for the entire period. The mortality rate of 1.7 per cent in 480 cases contrasts favorably with one of 0.6 per cent for my series of 288 private cases in other hospitals. A factor in the low mortality of the latter series was that the patients were entirely under the care of one individual.

Table 3. *Mortality Rates in Goiter Cases, 1929-1937.*

TYPE OF LESION			NO. OF CASES	NO. OF DEATHS	PERCENTAGE MORTALITY
Goiter			480	8	1.7
Toxic		324		6	1.9
Nodular	74			1	1.4
Diffuse (including recurrent)	250			5	2.0
Non-toxic		156		2	1.3
Nodular	143			2	1.4
Diffuse	13			0	—

TOXIC CASES

An analysis of the toxic cases is summarized in Table 4. The poor risks included those with decompensated hearts, those with marked toxicity and poor response to iodine, those with emaciation, and the aged. This group was very rigidly selected, and several cases in which it was felt essential to do two-stage operations rather than risk a fatality are not included. The mortality rate of 23 per cent in this group emphasizes the exclusiveness of the group.

Eighty-five patients (23 per cent) were over forty years of age, a high percentage in a disease that is prone to attack youth and the middle-aged. The

oldest toxic patient was sixty-seven, the youngest twelve.

The 11 patients with diabetes did uniformly well, though several were severely toxic. The incidence in our series is approximately three times as high as that reported by other clinics.[1, 2] Six of these patients were over forty, and 3 had cardiac manifestations. One patient with an initial basal metabolism rate of +90 per cent had such severe diabetes that she went into coma on the morning she was to receive a basal metabolism test because of the omission of the morning dose of insulin. Over 700 urinalyses were done while she was in the hospital. Two pole ligations and a two-stage thyroidectomy done in 1928 relieved the hyperthyroidism and markedly alleviated the diabetes until 1932, when she was operated on for a recurrence. The basal metabolism rate in 1937 was +7 per cent. Another patient had had three thyroidectomies elsewhere before coming to us with recurrence. Another went into coma a day after operation despite every effort to regulate her diabetes. One patient had a fasting blood sugar of 500 mg. per cent on admission.

Table 4. *Analysis of Toxic Cases.*

TYPE OF PATIENT	NO. OF CASES	PERCENTAGE OF TOTAL	NO. OF DEATHS	PERCENTAGE MORTALITY
Poor risk	53	14.2	12	23
Over forty years of age	85	22.7	5	6
With diabetes	11	2.9	0	—
Psychotic	11	2.9	1	9
With cardiac disease	34	9.3	4	12
Fibrillating 14				
Decompensated 6				
With substernal thyroid	14	3.7	0	—

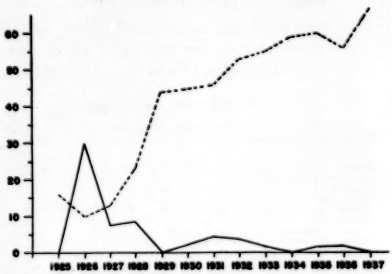

Figure 2. *Incidence and Mortality Rates in Toxic and Non-Toxic Thyroid Cases Operated on at the Boston City Hospital, 1925-1937.*

The dotted line represents the number of cases; the solid line, the mortality rate.

Most of the 11 psychotic patients were seen in consultation by the Neurological Service and the diagnosis was confirmed by them. With one exception their psychotic symptoms disappeared within two weeks after operation. The greatest difficulty experienced with these patients was to keep them in the hospital until operation. They all had an untoward fear of operation, and 2 patients who were markedly toxic and psychotic left the hospital against advice without surgery, despite all attempts at dissuasion by the house staff and relatives. It is interesting that 2 patients came to us after temporary commitments in a psychopathic hospital, one six months and the other eight weeks previously, for "extreme nervousness."

Patients with cardiac complications constitute a group in which, as is generally recognized, the risks of surgery are great. Of the 34 patients with cardiac disease 4 died as a direct result of cardiac dysfunction, a mortality of 12 per cent; viewed in another light, 4 of the 12 total deaths, or 33 per cent, were due to cardiac failure.

It is difficult to classify the cases with cardiac complications. There were 6 cases which showed evidence of decompensation preoperatively; of these 3 were fibrillating. Eleven more were fibrillating but showed no other evidence of failure. Three patients were classified as having enlarged hearts and as fibrillating. One case was diagnosed as thyroid heart, 2 as hyperplasia with fibrillation, and 1 each as cardiac hypertrophy, angina pectoris, arteriosclerotic heart disease and aortic regurgitation. Eleven cases were diagnosed clinically as rheumatic heart disease on the basis of enlargement and the presence of aortic and mitral murmurs; this group is interesting from the point of view of diagnosis, and a heated debate ensued over a case in which Dr. Ohler and Dr. Soma Weiss felt that the aortic and mitral murmurs were not inconsistent with the heart of long-standing hyperthyroidism. Their contention seemed to be borne out by the autopsy findings, inasmuch as the heart valves were filmy and without evidence of pathologic change.

I am convinced that any patient with heart disease and the added burden of hyperthyroidism, even though it is apparently mild, is in urgent need of having the extra burden relieved by surgery. This applies also to adenomas which are clinically non-toxic. I have seen several cases of heart disease in which the removal of non-toxic adenomas resulted in improvement of the cardiac condition. The probable explanation is that any adenoma, however benign pathologically, may undergo mild toxic changes, involute and possibly revert to toxicity. This conforms to our knowl-

edge of the changes in the diffuse toxic type of gland, and it cannot be said that we know that an adenoma is harmless, aside from the possibility of malignant change.

The number of patients in the entire series treated by stage operations was 42, or 11.2 per cent. The number so treated dropped off markedly from the period 1925-1929, and in 1937 there were no two-stage operations. This does not mean, however, that we think that such operations can be entirely dispensed with. There is a definite indication for them in poor risks, especially young adults with marked toxicity in whom the likelihood of storm is suggested by a rise in pulse to over 160 during the first part of the operation.

The cases of substernal goiters numbered 32—14 toxic and 18 non-toxic. An interesting feature of these cases was that all but four patients were over forty. There was 1 case of atelectasis and 1 fatal case of pneumonia in the non-toxic group. In practically all these cases the pretracheal muscles on one or both sides were cut to facilitate exposure. It is important as a safeguard against hemorrhage to ligate the blood supply preliminary to delivery of the gland.

An analysis of the 12 deaths in the toxic group shows them to fall largely in the categories of cardiac failure (4 deaths) and storm (3 deaths). One death each resulted from pneumonia, anesthesia, myasthenia gravis, glucose reaction and pulmonary embolism. The 2 deaths in the non-toxic group were the result of pneumonia and cerebral embolism respectively.

Among the toxic cases were several with complicating factors which required discernment in their management. It has been our policy to treat thyrotoxicosis first, in the presence of other surgical diseases. A Negress was admitted to our service with a diagnosis of acute appendicitis. She had marked tenderness and spasm in the right lower quadrant, a temperature of 99°F., a white-cell count of 12,000 and a persistent pulse of 120. Careful history disclosed increasing nervousness. There was mild exophthalmos, tremor, and a diffuse enlargement of the thyroid gland, with bilateral bruit. The basal metabolism rate was +33 per cent. The patient was given iodine and had a remission of toxic symptoms, but the abdominal signs did not abate. Surprisingly enough, the pain ceased within two days after the subtotal removal of a hyperplastic gland. It was our impression that the physical findings had been exaggerated by the increased irritability to stimuli accompanying the hyperthyroidism. Biliary colic with jaundice appeared in a patient with thyrocardiac disease while she was receiving iodine preoperatively. Fortunately her jaundice and pain subsided and thyroidectomy was performed. She refused to return for abdominal exploration. A patient with typhoid fever had severe coincident toxic goiter; as a result of bilateral pole ligation the temperature dropped, and a case with poor prognosis progressed to early recovery.

I do not share the prevalent belief that the basal metabolic rate is a sine qua non in the diagnosis of thyroid dysfunction. More than most laboratory tests, it is subject to wide variation depending on uncontrollable factors. Oftentimes it is markedly lower or higher than the clinical findings indicate. One reading should never be accepted as final, and if repeated readings are at variance with the other data in a given case, too much weight should not be placed on them. One patient in our series had all the symptoms of hyperthyroidism, and a basal metabolic rate repeated several times revealed an average reading of —11 per cent. A hyperplastic gland was removed, after which the patient returned to normal, without any symptoms of myxedema and with a basal metabolic rate of —20 per cent.

POSTOPERATIVE COMPLICATIONS

The feature of our series which gives us the greatest satisfaction is the low incidence of postoperative complications (Table 5). Hemorrhage, as we understand the word, was non-existent. In 2 cases there was a bloody ooze, which necessitated changing the dressing three times within the first twenty-four hours after operation, but in neither case was there any reaction in the patient's general condition, nor were any efforts to control the bleeding necessary.

Table 5. *Postoperative Complications.*

COMPLICATION	NO. OF CASES	PER CENT
Psychosis	4	1.0
Thyroid storm	3	0.8
Wound infection	3	0.8
Pneumonia	3	0.8
Atelectasis	2	0.5
Tetany	2	0.5
Mediastinitis	1	0.2
Cerebral embolus	1	0.2
Pulmonary embolus	1	0.2
Scarlet fever	1	0.2
Urinary retention	1	0.2

The sole transfusion in the entire series was given to a patient who developed mediastinitis and secondary anemia from prolonged sepsis. This was our only case of mediastinal infection. The patient, a woman of twenty-six, underwent a subtotal thyroidectomy on December 6, 1934. Four days later the temperature rose to 102°F., and later physical examination revealed signs of pneumonia, which were confirmed by x-ray. The patient complained of pain under the sternum, and

the fever continued. Slight widening of the mediastinum was noted in subsequent roentgenograms (Fig. 3). The wound meanwhile had healed by first intention. Since the patient's condition was not alarming, it was thought that conservative treatment was indicated. By January 5, 1935, the mediastinal shadow had increased considerably, with deviation of the trachea to the right. The neck had become indurated and the wound was bulging. The wound was opened, with the escape of several ounces of creamy pus which on culture showed hemolytic streptococci. Without any attempt to explore the abscess a drain was placed in its cavity. The temperature promptly subsided, drainage ceased in two weeks, and the patient was discharged six weeks after her primary operation.

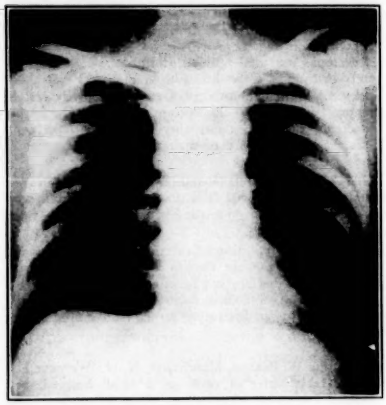

Figure 3.

There were only 2 cases of tetany; both were temporary and were relieved by the administration of calcium. Pulmonary complications, including both pneumonia and atelectasis, totaled only a little over 1 per cent. There was 1 case of paralysis of a single vocal cord. In 2 cases the trachea was inadvertently nicked; it was immediately closed with one or two interrupted stitches, including a piece of muscle, and no complications resulted. One of the cases of atelectasis and 1 of those of pneumonia occurred in the non-toxic group; the only other complication in that group was a fatal case of cerebral embolism.

In 17 of the 32 cases of toxic recurrence the primary operation had been performed by us. This is an incidence of recurrence in our series of 4.9 per cent. Although no attempt was made to trace the whole series of cases we believe that practically all the patients returned to our follow-up clinic and, hence, that this percentage of recurrence is approximately correct.

MISCELLANEOUS CASES

Four of the 5 cases of acute thyroiditis, all suppurative and all operated on, occurred subsequent to our report[3] of 10 cases of acute thyroiditis in 1934. A mortality of 50 per cent in these 4 cases, in spite of every effort to save the patients, emphasizes the gravity of the disease. It is interesting to note that 1 of these patients, drained in 1936 with recovery, was operated on at another hospital in 1937 and an intrathoracic malignant tumor of thyroid origin was found. The 5 cases of chronic thyroiditis conformed in general to groups of cases well described in the recent literature. Three were of the Hashimoto type.

The 5 cases of malignancy were undiagnosed before operation, and hence may indicate the percentage that will be encountered in a group of adenomas supposed preoperatively to be benign. They are not an index of the relative incidence of malignancy, since during the period covered by this report there were several cases which were presumptively diagnosed as carcinoma of the thyroid, but which had advanced beyond the reach of surgical therapy.

The single aberrant thyroid was found between the skin and the ribbon muscles, and appeared to be a misplaced lobe, as one lobe was in its normal place and the other was absent.

SUMMARY AND CONCLUSION

The development of the management of patients with thyroid disease at the Boston City Hospital is discussed, and a series of 559 cases treated surgically from 1925 to 1937 is analyzed. Interesting aspects, mortality rates and complications are considered.

This series justifies the belief that with adequate organization, plus considerable personal effort, patients with surgical diseases of the thyroid can be satisfactorily cared for in a large municipal hospital.

319 Longwood Avenue.

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DISCUSSION

DR. ISAAC M. WEBBER, Portland, Maine: The financial state of our community in Maine being as restricted as it is, it seems likely that a material number of indigent patients with goiter will be treated in some of our small community hospitals instead of being sent to medical

centers where the last refinement in diagnosis and treatment is available. It becomes the duty of some of us connected with these hospitals to render the best service we can to these unfortunates.

On the service at the Maine General Hospital we have endeavored to approximate the good results that have been reported by Dr. Cochrane and others. In a group of 200 consecutive goiter patients surgically treated, 2 succumbed in the hospital. Every patient, regardless of the severity of the thyrotoxicosis or any other complication, was subjected to operation before leaving the hospital.

As to the 2 fatalities, 1 patient had been thyrotoxic for four years, had had two incomplete resections of the thyroid in another hospital, and came to us some three months later in a thyroid storm. After what we believed to be an adequate preparation, she was subjected to operation, at which time the greater part of one thyroid remnant was resected with very little difficulty; yet the patient developed a fatal thyroid storm. The second non-survival was an emaciated woman, thyrotoxic for many months, brought to us because of a psychosis, the salient features of which were absolute disorientation and the belief that her food was being poisoned. After an attempt at preparation which was unsatisfactory because of the patient's inability to co-operate, superior pole ligations were performed and later a subtotal lobectomy. The operation resulted in an exacerbation of symptoms which caused death.

As you would surely expect, I think, depleted organic reserve and independent heart disease were the two factors which most frequently caused some of our patients to be placed in the bad-risk group. Of 36 patients with varied degrees and types of cardiac damage, 6 had congestive failure at the time they arrived at the hospital, yet all survived thyroidectomy. The major complications relating to surgical technic comprised 3 cases of transient tetany, injury to a single recurrent nerve, and bleeding in 1 case which necessitated reopening of the wound.

In the light of our incomplete knowledge of the etiologic factors in goiter, the impression that I have gained, both from the management of a small group of cases and from the reported experiences of others, is that the present morbidity may be further reduced if some means can be devised whereby patients are brought to proper management and operative treatment before their organic reserve is too badly depleted by long-standing thyrotoxicosis.

The management of goiter at the Maine General Hospital in the past seven years has been conducted much as outlined by Dr. Cochrane; therefore his comprehensive analysis of the work done at the Boston City Hospital has been of particular interest to me.

Dr. Thacher W. Worthen, Hartford, Conn.: It is hardly necessary to state that there are certain groups of cases in general surgery for which special assignments produce better than average results. This is particularly true of thyroid surgery and of surgery of the gastrointestinal tract. There are many institutions, however, in which this is a difficult if not impractical arrangement under existing conditions. The problem in such hospitals is that of endeavoring to lift the general average of surgery done for these conditions. Much will depend on the initiative and ability of the operator, but in general hospitals it seems to me that if left to these two factors alone satisfactory progress will not be made.

A third factor can be brought into play which in our experience during the past four years has seemed to produce satisfactory results; that is the annual report to the staff of a detailed analysis of all hospital deaths, grading them with reference to avoidability, to investigation, to preoperative and postoperative care, to operation, to consultations, to records, and so forth. When this is done, the mortality rate in those groups in which it was too high will drop and there will be fewer avoidable deaths. For example, our total hospital mortality rate for thyroidectomy in cases of toxic diffuse thyroid disease was about 3 per cent, individual groups of cases treated by certain surgeons being lower. The group of toxic nodular thyroid disease presented a mortality well under 2 per cent. There was an incidence of malignancy of 1 per cent in our series of 893 cases.

Dr. Cochrane's excellent results are a splendid tribute to his individual effort. It is noteworthy that he has no recorded case of damage to the laryngeal nerve or of hemorrhage.

In spite of the reporting of excellent mortality rates and few complications, there remain the problems of recurrences, of cases that are not benefited in any way by thyroidectomy, and of iodine fixation at high basal rates, which is with us an increasing rather than a diminishing factor.

Dr. David W. Parker, Manchester, N. H.: We have had a considerable series of cases for a small hospital, and sometime I hope to report them. The iodine-fast cases, referred to by Dr. Worthen, are particularly distressing and hard to prepare for a safe thyroidectomy. I think that we as a group can do something about this. Iodine is too generally used by the family physician when he sees a toxic thyroid. I think that if he could be impressed with the fact that the administration of iodine is absolutely dangerous except as a preoperative measure, we should accomplish a great deal in reducing the number in this bad-risk group of iodine-fast cases.

ELECTROCARDIOGRAPHIC CHANGES IN VITAMIN B_1 DEFICIENCY*

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PROVIDENCE, RHODE ISLAND

SEVERAL patients recently admitted to the Rhode Island Hospital with clinical evidence of vitamin B_1 deficiency showed abnormal electrocardiograms that might be interpreted as indicative of serious myocardial disease, but under a high-vitamin regime the patients recovered within a few weeks.

Electrocardiographic abnormalities in patients suffering from vitamin B_1 deficiency have been observed and reviewed by various writers. Little emphasis, however, has been placed on the possibility of confusing the electrocardiographic changes found in certain cases of beriberi cardiovascular disease with those found in other myocardial disturbances. Aalsmeer and Wenckebach[1, 2] studied the cardiac aspects of beriberi among the inhabitants of Java. Electrocardiograms were normal except for a shortening of the conduction time and tachycardia. The P–R interval was 0.12 second or shorter. It returned to normal during convalescence. There was increased skin resistance, even greater than that found in myxedema, although the deflections were normal or much larger than normal. Keefer,[3] referring to another article published by Aalsmeer and Wenckebach, notes that they also found right ventricular preponderance in some cases. In this country Scott and Herrmann[4] described negative T_1 and T_3, and said that some patients showed left and others right ventricular preponderance. Moreover, they called attention to the low voltage and to slight aberrations in the ventricular complexes. In 1 of their cases they noted a greatly prolonged R-T interval. Keefer,[3] reporting a series of cases in Peiping, China, stated that there were no characteristic changes in the electrocardiogram, although there was some evidence of myocardial disease. He described low voltage, right and left ventricular preponderance and negative T waves. Weiss and Wilkins[5, 6] also found abnormalities of the T waves, low amplitude, prolongation of the electrical systole (Q–T) and sinus tachycardia. In addition they noted changes indicative of coronary or myocardial disease; these complexes returned to normal with adequate vitamin B_1 intake. Some of these abnormalities were found before and some after treatment was begun. As the patients improved following the administration of vitamin B_1 they showed increased utilization of oxygen, slowing of blood flow, diuresis, slowing of the heart rate, increased vital capacity and a decrease in the size of the heart, but the electrocardiographic abnormalities were the last to disappear. Zoll and Weiss[7] were able to reproduce many of the abnormal variations in an experimental study on rats kept on a diet deficient in vitamin B_1. Moreover, normal electrocardiograms were re-established after a definite vitamin B_1 intake. Feil[8] found similar but more variable changes in a group of patients with pellagra, namely inversion of the T waves in Lead 1 or 2 or both, a Pardee type of S-T with large T waves. Both electrical and mechanical systoles were prolonged. Weiss and Wilkins[6] suggested that these abnormalities were due to deficiency of vitamin B_1 rather than to that of other fractions of the vitamin B group. Their reason was that similar changes were induced in rats with vitamin B_1 deficiency and in patients without pellagra.

We are presenting several cases with histories of unbalanced diets and clinical evidence of vitamin B_1 deficiency. These patients all showed abnormal electrocardiograms. The group comprises 6 male patients ranging in age from thirty-four to fifty. All gave a history of habitual use of alcoholic beverages, usually beer, and concurrently a deficient diet. All entered the hospital because of swelling of the legs and some dyspnea. Two also had swelling of the abdomen. In only 1 case was there a complaint of substernal discomfort; the sensation was of questionable significance and occurred long after the onset of symptoms and electrocardiographic changes. Four patients did not show patellar or Achilles tendon reflexes, and in 1 these reflexes were sluggish. There were sensory abnormalities such as hypesthesia and paresthesia in 2 cases, and a recent history of transient paralysis of the right arm in 1. All but 1 patient received a high-vitamin diet, and all received vitamin B_1 medication. In 2 cases the heart sounds showed notable changes with treatment; in 1 of these a gallop rhythm disappeared soon after entrance. In 3 cases marked reduction in the size of the heart was demonstrated, either by percussion or by x-ray examination, as treatment progressed. In 1 case slight enlargement

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was shown by x-ray early in treatment but no film establishing the return to normal could be obtained subsequently, and in 1 case the persistent enlargement was thought to be related to hypertensive heart disease. Estimations of total protein of the blood were normal except in 2 cases, in which the percentage was slightly below 5.0 gm. per cent. In only 1 case was there definite anemia, hypochromic in type, and this responded to treatment during the hospital stay. All patients exhibited a weight loss of from 8 to 28 pounds, the average being 18.4 pounds in twelve days, concurrently with reduction of edema. Only 1 patient received digitalis in addition to vitamin therapy.

CASE REPORTS

Case 1. A. D., a 39-year-old French-Canadian cloth examiner, entered the hospital November 26, 1937, because of swelling about the ankles and enlargement of the abdomen. For 6 months he had been drinking some whiskey and twenty to thirty glasses of beer a day. He had been eating only two meals a day and taking very little fruit or green vegetables. He had suffered no substernal distress. There was no orthopnea, but for a short time he had noticed dyspnea on exertion.

On admission the temperature was 99°F., the pulse 100 and the blood pressure normal. The apex impulse of the heart was palpable in the fifth left intercostal space 10 cm. from the midsternal line. The sounds were of good quality. There were no murmurs. The peripheral arteries were not thickened. There was shifting dullness in the flanks of the abdomen, and a slightly tender liver edge could be felt 2 fingerbreadths below the costal margin. There was slight pitting edema around the ankles. Patellar and Achilles tendon reflexes were absent.

The patient was placed on a high-vitamin and high-protein diet, and starting on the 2nd day was given by mouth and intravenously about 9 mg. of vitamin B_1 daily.* An x-ray on the 7th day showed a slight increase in the size of the heart shadow, with evidence of chronic passive congestion in both lung roots. There was no free fluid in the pleural cavities. By the 12th day edema was practically absent and the patient was out of bed. The weight changed from 188 pounds on the 2nd day to 180 pounds on the 13th.

This patient presented electrocardiographic changes (Fig. 1) that are of interest; on admission the record showed flattening of the T waves, a low voltage and a rapid rate. These alterations became much less marked within a very few days. He was not clinically very sick, although the first record might give that impression.

The urine was free of albumin. Glucose tolerance tests were normal. The galactose tolerance test 4 days after admission showed no excretion (normal excretion is from 0 to 3 gm.). The hippuric-acid excretion test, done 1 day after admission, was 22 per cent of normal; 11 days later, during diuresis, it was 80 per cent, and 2 days later it was 58 per cent. Thus although the galactose tolerance test was normal the hippuric-acid test showed some evidence of decreased liver function. The fact that the liver function test improved following diuresis seems to indicate that the decreased liver function was due to cardiac decompensation and passive congestion. The fact that the blood cholesterol was not low — it was 276 on admission and 184, 13 days later — corroborates this interpretation. Phenolsulfonephthalein excretion showed a total of 65 per cent. There was no anemia and the blood smear was normal. Blood chemical determinations were within normal limits. An icteric index was normal.

The patient was discharged from the hospital on the 18th day.

Case 2. J. K., a 36-year-old, unemployed Irishman, entered the hospital on August 9, 1937, complaining of swelling of the legs and cough for the last 2 weeks. For the last 10 years he had drunk large amounts of alcohol, and for the last 2 years had been eating poorly, taking almost no meat. There had been frequent episodes of delirium tremens. For the last few months he had become progressively weaker, and dyspneic on the slightest exertion. He could not lie flat without discomfort. He had at no time suffered pain in the chest and had not noticed palpitation. Only once previously had he noticed swelling of the legs. This subsided after bed rest.

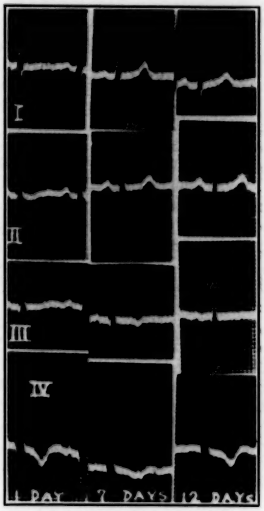


Figure 1. *Case 1.*

Note later increase in height of T waves (precordial leads by old method).

On entry the patient was obviously dyspneic. A few rales were heard at the base of the right lung. The blood pressure was 128/80. By percussion the left cardiac border was measured 8 cm. from the midsternal line, just within the midclavicular line. The apex impulse was felt in the fifth interspace. The cardiac rate was 110, the action regular and the sounds of good quality. The liver was not felt. The hands, thighs and lower legs showed pitting edema. No reflexes could be elicited in the legs.

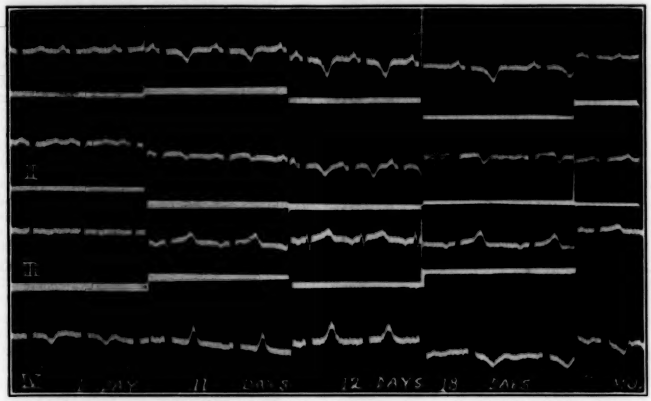
*Betalin S (Lilly), synthetic vitamin B_1, was used in all cases.

After the 1st day the patient began to receive a well-rounded diet and about 10 mg. of added vitamin B_1. By the 3rd day the edema of the legs had disappeared, although on the 5th day a little sacral edema was still present. By the 8th day the patient was allowed to be out of bed. At the end of 2 weeks there was no clinical evidence of myocardial disease and the patient complained of no pain whatsoever. The blood pressure on the 14th day was 132/98. The weight dropped from 123 pounds on the 2nd day to 110 pounds at the end of 2 weeks.

tions for syphilis were negative. The urine showed an occasional trace of albumin. Morphological and chemical blood studies showed nothing abnormal except a slightly lowered blood protein on admission. This became normal by the 10th day.

The patient was discharged on the 21st day.

Case 3. J. V. G., a 34-year-old Irish bartender, entered the hospital on October 14, 1937, complaining of shortness of breath and swelling of the abdomen and ankles



K = 0.439 0.434 0.470 0.390 0.391

Figure 2. *Case 2.*

Note return of T waves to normal after marked inversion; Q_4 wave persistently present (precordial leads by old method).

The first electrocardiogram (Fig. 2) was not normal for a young male adult. The rate was rapid and the ventricular complexes showed absent or flattened T waves. In 10 days, coincident with definite clinical improvement, the electrocardiogram had changed to such an extent that it could well be mistaken for that of an anterior coronary occlusion. The abnormality increased somewhat and then showed a slight trend toward a more normal condition. On the patient's discharge, when he was clinically well, the electrocardiogram was decidedly abnormal, even in the chest lead, which generally in this series of cases showed little disturbance. A record made 7 months later was similar to the first in this study.

An x-ray film on admission showed slight diffuse enlargement of the heart shadow with congestion about the lung roots. No fluid was found in the costophrenic angles. A week later a film showed the same increase in the heart size, but an improvement in the pulmonary congestion. Orthofluoroscopy on the 12th and 21st days confirmed the persistent slight enlargement of the heart suggested by x-rays, the cardiothoracic ratio being 12.8 to 23.3 cm. and 12.5 to 24 cm. respectively. The heart was globular in shape, and there was moderate dynamic dilatation of the proximal portion of the aorta. On a return visit 7 months later, orthodiagraphy showed the same measurements.

Laboratory findings showed that the serological reac-

of 3 weeks' duration. For the last 15 years the patient had frequently taken as much as a quart of liquor a day. Three years previously he had had some swelling of the ankles. For the last 3 years he had been a bartender and had been taking his meals irregularly. One month before entry he had begun to notice shortness of breath on climbing stairs, and shortly after this, swelling about the ankles and enlargement of the abdomen.

On examination the blood pressure was 130/90. By percussion the heart was apparently of normal size. No murmurs were made out. The second pulmonic sound was equal in intensity to the second aortic sound. In the abdomen there appeared to be fluid in the flanks, and the liver reached below the costal margin, as was judged by percussion. There was pitting edema of both legs. The patellar reflexes were absent. There were no sensory disturbances.

At entrance the patient was given a high-carbohydrate and low-fat diet, with added vitamin B_1. On the 4th day the diet was altered to contain more protein. The patient received no diuretic. The course was afebrile. The blood pressure remained low — 120/80 on the 12th day and 90/60 on the 18th. By the 6th day the edema had begun to clear and by the 11th day it was gone. The patient was up and about the ward by the 21st day.

An x-ray of the chest on the 4th day showed a transverse enlargement of the heart shadow, and evidence of

marked congestion in the lung fields (Fig. 3 *C*-1). On the 11th day re-examination of the chest showed clearing of the lung fields, and the heart appeared smaller.

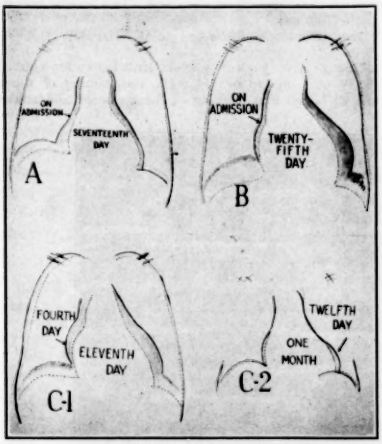


Figure 3. *Diagrams to Indicate Shrinkage in Size of the Heart with Therapy.*

A *represents Case 4;* B, *Case 5; and* C-1 *and* C-2, *Case 3.*

On the 12th day fluoroscopy showed that the diaphragm moved normally. The heart was very slightly enlarged to the left (Fig. 3 *C*-2), and the aorta not widened. The cardiac pulsations were feeble. Orthofluoroscopy this same day showed a cardiothoracic ratio of 14.4 to 26.2 cm., and 1 month after entry the heart was further reduced so that the ratio was practically normal, 13.1 to 25.9 cm.

Electrocardiograms showed that during treatment the heart rate became slower but the abnormal ventricular complexes were intensified; finally the record became confined within normal limits (Fig. 4). There were no clinical findings to account for the unusual changes in the electrocardiograms.

Laboratory findings included a negative Wassermann test, evidence of a slight hypochromic anemia, and normal protein, urea, glucose and cholesterol determinations. Galactose tolerance and hippuric-acid tests were normal. The urine was normal except for an occasional trace of albumin.

The patient was discharged on the 23rd day.

Case 4. J. L., a 45-year-old Italian laborer, entered the hospital December 22, 1937, complaining of swelling of the legs and ankles and shortness of breath for the last 3 weeks. He had given up work as a laborer. He had been drinking beer, at times in excess, and his dietary habits had been poor. The temperature on admission was 98.6°F., the pulse 80, the respirations 20 and the blood pressure 120/80.

The apex impulse of the heart was palpated in the fifth left intercostal space 8 cm. from the midsternal line, and by percussion there seemed to be enlargement. The sounds were faint and muffled. The lungs were clear. The liver could not be felt below the costal margin. There was slight pitting edema from the ankles to the knees. The patellar and Achilles tendon reflexes were sluggish, while others were hyperactive.

In the hospital the patient received a high-vitamin diet, with about 10 mg. of vitamin B_1 added daily. By the 9th day he was up and about without recurrence of edema. On entrance an x-ray film showed an elevated right diaphragm and a heart shadow moderately enlarged in its transverse diameter, and apparently displaced to the right (Fig. 3 *A*). No free fluid was demonstrable. Four days later the heart shadow appeared to be of the same size, but subsequent x-rays showed a marked diminution in the size of the heart and a clearing of the lungs. Orthodiagrams made on the 19th day, 1 day before discharge, showed a cardiothoracic ratio of 11.5 to 25.3 cm., contractions of good quality and slight dynamic dilatation of

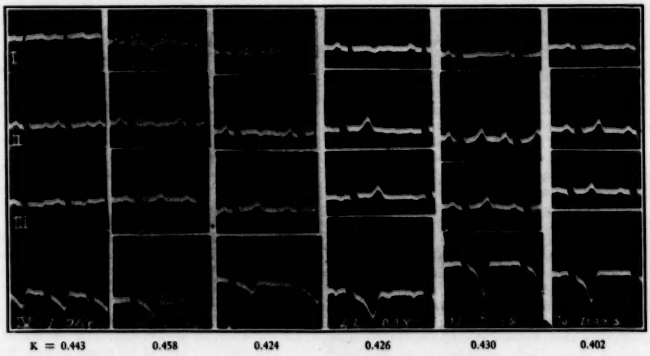


Figure 4. *Case 3.*

Note T_1 and T_3 inversion at eight and twelve days, with return to normal later (precordial leads by old method).

the proximal aorta. The course was afebrile. On the 2nd day the patient weighed 145 pounds, but by the 6th day only 118 pounds. The latter weight remained constant during the remainder of his hospital stay.

A series of electrocardiograms showed that the low voltage, rapid rate and flattening of the T waves in the first tracing all changed rapidly toward normal (Fig. 5).

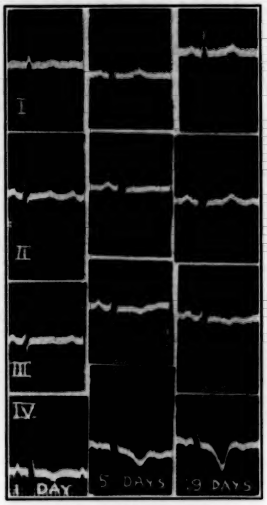


Figure 5. *Case 4.*

Note increase in voltage and in height of T waves after treatment (precordial leads by old method).

The second and third tracings showed changes in the ventricular complexes in Leads 2 and 3 that were difficult to explain, particularly as the man was not in any way incapacitated physically and had no symptoms suggestive of sudden myocardial changes.

Laboratory tests showed only an occasional trace of albumin in the urine and no abnormal blood findings.

The patient was discharged on the 20th day.

Case 5. E. B., a 41-year-old Irish-American truck-driver, entered the hospital July 14, 1937, because of swelling of the legs and ankles for 2 months. There had been three previous hospital admissions. In 1932 there was paralysis of the right arm after a drinking bout, and a limp which lasted until discharge 7 days later. The patellar and Achilles tendon reflexes were hyperactive. In December, 1932, he was readmitted because of painful joints, but had no fever. No abnormal findings were noted in the heart. Malnutrition was present. In July, 1936, he re-entered the hospital because of ankle edema and dyspnea. The blood pressure was 150/80. The heart was slightly enlarged to the left. There was a systolic murmur over the left side of the heart, and the x-ray silhouette suggested mitral stenosis. The liver was felt 3 fingerbreadths below the ribs.

On July 14, 1937, the patient again complained of shortness of breath on exertion, and swelling of the legs. He had noticed palpitation. He gave a history of excessive beer-drinking, but asserted that he had been eating three meals a day in restaurants. He admitted no ataxia or paresthesia. The blood pressure was 120/80. There was a tremor of the tongue. Only occasional rales were noted at the lung bases. The heart seemed to be much enlarged to the left, and a definite gallop rhythm was heard. There were no definite murmurs. The rate was 120 and the action regular. The sounds were only of fair quality, and at one examination there appeared to be both systolic and diastolic apical murmurs. The liver was not felt. There was edema of the abdominal wall to the costal margins, and also of the back, legs and scrotum. No patellar or Achilles tendon reflexes were obtained, and there was impaired sensitivity to pain in the lower legs.

The patient was given digitalis for 9 days and ammonium chloride three times a day for 6 weeks. Besides a high-vitamin diet, he received 10 mg. or more of vitamin B_1. On the 3rd day he received 1 cc. of Salyrgan. By the 4th day, the lungs were clear and the edema was nearly gone, some remaining in the genitals. One week after admission the heart sounds were noted to be much stronger, with only a very soft apical systolic murmur remaining. The second pulmonic sound was louder than the second aortic sound, and accentuated. The blood pressure was 160/110. Furthermore, the heart seemed definitely decreased in size by percussion. The former gallop rhythm had disappeared. At the end of 2 weeks there was no pulmonary or peripheral edema. The heart was slow and regular, and the sounds were of good quality. The left border of the heart was 11 cm. from the midsternal line. The patellar tendon reflexes were still absent, although there was less numbness in the legs. On the 17th day an x-ray showed definite decrease in the size of the heart. Toward the end of the 4th week the patient complained of palpitation. After 1 month in the hospital he mentioned a feeling of constriction in the left chest, and seemed unduly excited by the interest shown in his condition. After 6 weeks he was allowed to be up and about the ward, at which time a marked weight loss was evident. There had been a loss from 165 pounds on the 6th day to 137 pounds at the end of 1 month. The latter weight remained constant until discharge, after nearly 2 months in the hospital.

On entrance, an x-ray film showed a large left ventricle and an increased supracardiac shadow (Fig. 3 *B*). There was passive congestion of the lower two thirds of the lung. Five days later there were practically the same findings. Fourteen days later there was clearing of the hilus shadows but still a slight diffuse enlargement of the heart. Twenty-three days later there was a definite decrease in the size of the heart, with clearing of the lungs and no remaining supracardiac widening. Orthofluoroscopy on two occasions after this time indicated that subsequently the heart remained constant in size and was well within normal limits, the cardiothoracic ratio being 12.5 to 27.5 cm.

A series of electrocardiograms covering a period of 6 weeks showed changes that might be mistaken for those due to coronary occlusion (Fig. 6). On the previous admission a year earlier the record showed a rapid rate, low voltage and increased electrical systole. These conditions improved during treatment. On this admission, after 1 week of treatment, although the patient was clinically well the tracing was quite abnormal. During the re-

mainder of the study the electrocardiograms returned to normal. The patient showed little clinical evidence of serious heart disease, such as might have been expected from the electrocardiographic changes.

Laboratory studies showed nothing abnormal except an occasional trace of albumin in the urine and a moderate secondary anemia, which disappeared before discharge.

Case 6. H. A. G., a 50-year-old German boxing instructor, entered the hospital September 4, 1937, complaining of swelling of the legs and eyelids for 10 days. The patient gave a history of drinking ten to twenty glasses of beer daily for the past 6 months and neglecting his meals. He had recently noticed shortness of breath on exertion. There was trembling of the hands. For several days the right hand and foot had been numb, without noticeable ataxia. There was no pain in the chest.

The blood pressure was 170/90. At both lung bases moist rales were present. The apex impulse was found in the fifth left intercostal space 11.5 cm. from the midsternal line. The action was regular, with a rate of 84 and an occasional extrasystole. The second aortic sound was louder than the second pulmonic sound and there was a soft systolic murmur at the apex. The first heart sound was somewhat booming. The liver edge was not palpable and there was no ascites. The legs showed no motor or sensory disturbance, but there was moderate pretibial edema, with none in the feet or over the sacrum.

The patient was given a diet high in protein and vitamins, with about 10 mg. of vitamin B_1 added. Forty-eight hours after admission the edema was entirely gone and the lungs were clear. By the 4th day the patient developed delirium tremens and was sent to the disturbed ward. He had then a rectal temperature of 104°F. On the 5th day the venous pressure was 39 mm. of water and the circulation time by the ether method was 9, 9 and 7.5 seconds respectively. The blood pressure remained elevated, being 150/100 at discharge. The patient lost 15 pounds in 11 days, weighing on the 4th day 158 pounds and on the 15th day 143 pounds. Except for the episodic fever of 104°F. the course was afebrile.

X-ray films of the chest on entrance showed the left lung more radiant than the right and the right diaphragm elevated as if due to an enlarged liver. The heart seemed to be enlarged to the left. Orthofluoroscopy on three occasions showed no significant change in the cardiovascular shadow over a period of more than 2 months. Elevation of the right diaphragm continued to be present, as well as dynamic dilatation of the proximal aorta. The cardiothoracic ratio averaged 13.6 to 26.5 cm.

The first electrocardiogram tracing, although quite unusual, should probably be considered within normal limits (Fig. 7). In 5 days the previously high T waves had flattened to the lower limits of normal. In succeeding records the ventricular complexes showed a trend toward the form seen in the first record.

Other laboratory findings were negative.

The patient was discharged on the 16th day.

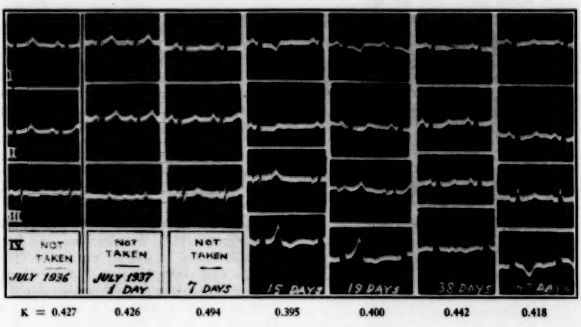


Figure 6. *Case 5.*

Note return of inverted T waves to normal, changes in T_4, but constant presence of Q_4 (precordial leads by old method).

COMMENT

Each case in this series was followed by repeated electrocardiograms at rather close intervals while under treatment. In the chest leads the old method was used. The common features seen on admission were increase in the electrical systole, according to Bazett's formula, a rapid rate and a tendency to low voltage, and in most cases a flattening of the T wave in Leads 1, 2 and 3. The chest leads showed the least tendency to become abnormal. In subsequent records, during treatment, all cases showed a slowing of the rate, an increase in the voltage and varying changes in the ventricular complexes. The changes in the ventricular complexes during treatment occurred quite rapidly, usually within a few days; curiously, as treatment progressed, during the first week or two the electrocardiograms became more abnormal and then tended to return toward normal (Figs. 2, 4 and 6). The abnormal ventricular complexes changed more rapidly than would be expected in coronary disease.

We have observed similar rapid changes in several conditions, such as acute nephritis, acute

pericarditis and diabetic acidosis. Similar observations in acute nephritis have been made by Master, Jaffe and Dack.[10] Recently we have seen

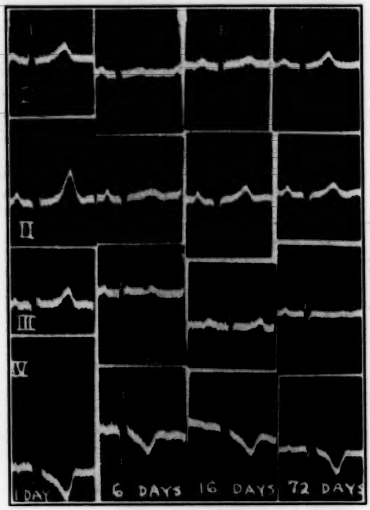


Figure 7. *Case 6.*

Note abnormal height of early T waves and later average size (precordial leads by old method).

rapid T-wave changes in a man suffering from hemophilia and a traumatic hemopericardium.

If the clinical conditions were not known, the interpretation of the electrocardiograms in some cases might easily be entirely incorrect. In a few cases coronary occlusion, except for the chest lead, would undoubtedly have been suspected. In 1 case two electrocardiograms had been made a year previously. Re-examination of these records showed an increase in the electrical systole, although at that time the clinical diagnosis of vitamin deficiency was not made, apparently because it was not considered in the differential diagnosis. Increased electrical systole is common to all these cases. Barker, Johnston and Wilson[11] have reported a series of cases showing increased electrical systole which they attribute to hypocalcemia. We have observed a case of acute nephritis, without vitamin deficiency, in which the electrical systole was increased but the blood calcium was normal.

T-wave changes, as described, may be caused by several conditions, and it is necessary, in interpreting electrocardiograms, to know the clinical findings.

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A JACKET FOR THE TREATMENT OF SCOLIOSIS*

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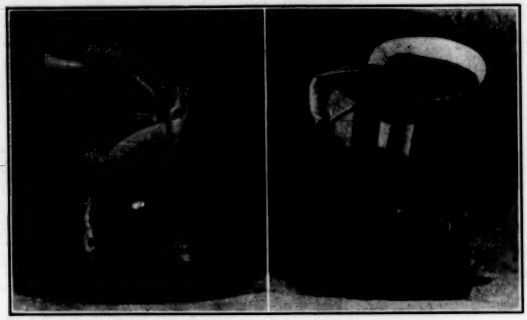
BOSTON

AN appliance designed by the writer for the treatment of scoliosis, after having been in use for nine years, has proved to be efficient both as a corrective and as a supportive measure (Fig. 1).

This brace, while embodying the same principle of overcorrection as does the Abbott jacket, has certain advantages that make it a more acceptable form of treatment. In the first place, the brace is applied with the spine extended, rather than in the flexed position necessitated by the Abbott technic. Secondly, pressure is exerted by means of a flexible elastic strap rather than by plaster of Paris. As the result of these modifications, discomfort from the position, as well as an unsightly appearance, is avoided; furthermore, there is no compression of the chest, distortion of the abdominal organs or interference with the circulation. The brace can be worn under the regular clothing and be kept on at night. On the other hand, it is easily removed to permit bathing and exercise. Because of the light construction of the appliance, patients do not complain of its being uncomfortable during warm weather.

Treatment by means of this jacket is most efficacious in the years of active growth, that is, between the ages of ten and fourteen. In the early stage of scoliosis, when the spine is still flexible and only slight accommodative changes are present, the existing curve can be lessened, if not actually corrected (Figs. 2 and 3). An improvement in balance can also be established by the development of secondary curves, the brace meantime preventing the sagging or increase of the primary curve that results in a loss of height (Figs. 4 and 6). The possibility of correcting, or at least of preventing, the increase of early scoliotic curves and of establishing better balance is a plea for the early recognition of these cases.



A B

Figure 1. *Brace for the Treatment of Scoliosis.*

In the later stages, when the curve is fixed and cannot be corrected, further strain and slumping can be prevented by the use of the brace. In these cases, care must be taken that the patient wears the brace for a sufficiently long period. The brace has been used successfully in controlling the development of curvature in cases of infantile paralysis; but, again, the corrective efforts must be long continued. The jacket works well in cases of scoliosis that eventually come to operative fusion. Before fixation, the curve is corrected and the balance improved as much as possible by the use of the brace, and following operation, the brace is used to secure the maximum correction while fusion is taking place (Fig. 5).

A plaster-of-Paris cast is used as a model for the construction of the jacket. This cast is taken with the patient standing, while a head piece exerts slight traction. The arm on the low side of the body is raised straight in the air, taking

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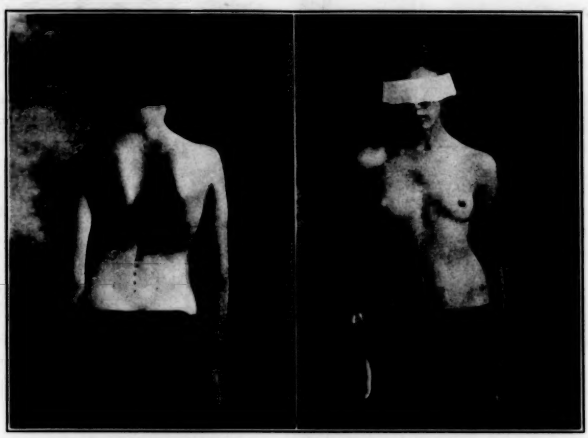
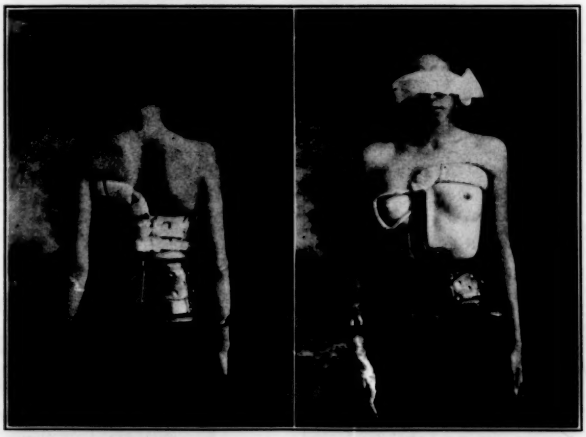


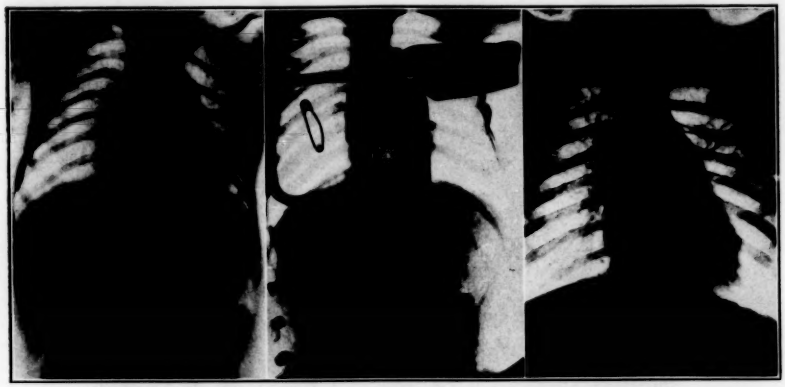
A B



C D

Figure 2. *Application of Brace (Case M. M.).*

A *shows correctible curves of the spine before treatment;* B, *the asymmetry of the chest before treatment;* C, *the spine in corrected position; and* D, *the improvement in the symmetry of chest.*



A B C

Figure 3. *X-Ray Photographs of Case J. O.*

A *shows the primary spinal curve;* B, *the correction of the curve by the brace; and* C, *the end-result, six years after the beginning of treatment.*

Figure 4. *X-Ray Photograph of Case L. G.*

This shows the end-result of holding a dorsal curve by the brace during the actively growing years while a secondary curve developed. Note that both curves are about equal in size.

Figure 5. *X-Ray Photograph of Case N. F.*

The spine is being held in the corrected position while fusion takes place.

a part of the body weight, and the other is held at an angle of 45 degrees to the body.

The brace is so constructed that absolute rigidity — a most important factor of an appliance of this kind — is obtained. A pelvic girdle of leather that is bound top and bottom with steel bands ensures fixation of the pelvis. Two steel uprights extend from this girdle, one from the back and one from the front. A heavy steel crutch that is 5 cm. in width and reinforced with leather connects these uprights. The front upright has a goose-neck curve to allow the pelvic girdle to be laced in front. It is also equipped with an outrigger that is carried well forward of the chest to allow for expansion. To this outrigger and to the back upright is attached an elastic strap that is about 10 cm. in width.

When the jacket is applied, the low shoulder is forced upward by the crutch. The elastic strap, when it is pulled into place, exerts constant pressure over the point of greatest convexity of the curve. Both the lateral and rotary curves are influenced by this pressure.

Treatment by means of this brace must be carefully supervised. It must be worn until the patient is beyond the flexible deforming age, and in some cases, two or three years may be necessary. While the brace is being worn, the customary therapeutic measures, such as exercise, are carried out.

A B

Figure 6. *X-Ray Photographs of Case F. M.*

A was taken before the brace was applied to hold the dorsal spine while a secondary curve developed; note that the ribs are practically impinging. B shows the corrective effect of the brace; note the separation of the ribs.

During the past nine years, 76 patients have been treated by the application of this brace. Twenty-nine of these patients had flexible curves that were correctible. Forty-one had severe structural curves, and in these cases the brace was used to prevent further strain and sagging. In the treatment of a group of 6 cases of spinal fusion, the brace proved to be of decided advantage.

412 Beacon Street.

REPORT ON MEDICAL PROGRESS

HODGKIN'S DISEASE AND ALLIED DISORDERS*

HENRY JACKSON, JR.†

BOSTON

THE title of this review is intended to include Hodgkin's disease, lymphosarcoma, reticulum-cell sarcoma and the so-called giant-follicle lymphoma. The word "allied" should not imply that the various pathologic conditions are necessarily related in their etiology or, for that matter, in their pathogenesis. They are allied, if you will, merely because they are diseases primary in the lymphoid tissues of the body, because their etiology is as yet unknown and because they present similar clinical pictures and have a similar course. For many purposes, these conditions may be grouped under one general heading, that of malignant lymphoma. Where a finer distinction between the subtypes is of genuine value to the practitioner, mention of that fact will be made.

HISTOLOGY

Space does not permit a searching analysis of the histopathological characteristics of each type of malignant lymphoma. Each may, however, be briefly defined.

In lymphosarcoma, the lymph nodes or other organs are diffusely invaded by lymphocytes, mature or, more rarely, immature. There is often notable involvement of the capsule and extensive invasion of adjacent organs. The condition may exist in conjunction with lymphatic leukemia. Indeed, the interrelation between lymphosarcoma and lymphatic leukemia is so intricate and so unpredictable that the two diseases may well be regarded, for practical purposes, as one and the same.

In reticulum-cell sarcoma, the diseased organs and nodes are invaded and destroyed by large, pale cells with vesicular nuclei and scattered chromatin. These cells, distinctly larger than even immature lymphocytes, are actively ameboid and irregular in shape. The cytoplasm is faintly acidophilic and considerable in amount. Eosinophils are not found. Fibrosis is rare. Invasiveness is common and often extreme.

Hodgkin's disease may be profitably subdivided into three types: lymphoma, granuloma and sarcoma.

In Hodgkin's lymphoma, the architecture of the involved lymph nodes is diffusely replaced by mature lymphocytes, among which are scattered a few, or more rarely many, typical Reed–Sternberg cells. There is neither eosinophilia, fibrosis nor necrosis. Careful study may be necessary to distinguish this form of Hodgkin's disease from lymphosarcoma. The differentiation is, however, of much practical importance.

The pleomorphic histological picture of Hodgkin's granuloma is familiar to all. There is fibrosis, often extreme, eosinophilia, necrosis with polymorphonuclear leukocytic infiltration, and, of course, typical Reed–Sternberg cells, without which the diagnosis cannot be properly made.

In Hodgkin's sarcoma, the involved tissues are invaded by large cells of uniform size and with considerable basophilic cytoplasm. The nuclei are round, and present characteristically a prominent nucleolus. There is neither fibrosis nor true necrosis, though dead cells may appear here and there. Eosinophils are not found. Some cells are multinucleated and there are scattered typical Reed–Sternberg cells, a sine qua non for the diagnosis, as in the case of Hodgkin's granuloma and lymphoma.

Hodgkin's lymphoma may with the passage of time take on the full histological characteristics of Hodgkin's granuloma. Furthermore, the latter may, more rarely, become malignant, excised tissue then showing areas indistinguishable from Hodgkin's sarcoma. We have fibroid phthisis, classic tuberculosis with cavity formation and miliary tuberculosis; so we have Hodgkin's lymphoma, Hodgkin's granuloma and Hodgkin's sarcoma. The prognostic implications of these finer subdivisions of Hodgkin's disease will be discussed subsequently.

In giant-follicle lymphoma,[1] the lymph nodes are studded in both cortex and medulla with large germinal centers composed of uniform, rapidly multiplying cells of uncertain origin. The absence of necrosis, polymorphonuclear neutrophils and phagocytosis serves to distinguish this condition from simple inflammation. This type of malignant lymphoma frequently progresses into one of the other varieties, whether it be Hodgkin's disease, reticulum-cell sarcoma or lymphosarcoma.

ETIOLOGY

The etiology of these diseases is unknown. There is still, indeed, much dispute as to whether

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they should be regarded as neoplastic or infectious.[2] It is probable that lymphosarcoma and reticulum-cell sarcoma are true neoplasms and owe their origin to the obscure causes of such conditions. The frequent presence of inflammatory processes close to the site of these tumors has led some investigators to believe that chronic infection may play a role in their origin. On the other hand, it is thought by many that Hodgkin's disease is a true infectious granuloma. Certainly, as Ewing has said, "Tuberculosis follows Hodgkin's like a shadow." It has never been established, however, that the tubercle bacillus is of etiologic importance. For the present, the cause of malignant lymphoma in all its varied forms remains obscure.

AGE INCIDENCE

Malignant lymphoma spares no age.[3] There are certain important differences, however, in the age distribution of the various types. Hodgkin's disease — whether Hodgkin's lymphoma or Hodgkin's granuloma — is very evenly distributed through the first six or seven decades. It is virtually as common in the fifties as it is in the teens. This fact is often overlooked.

The age distribution of reticulum-cell sarcoma is quite different. Very low in the first and second decades, the incidence rises rapidly and steadily to a peak in the sixth, only to fall as rapidly again. A similar age distribution is found in the Hodgkin's sarcoma group — the incidence, in short, of malignant disease in general. The lymphosarcomas show a high peak in the second decade (22 per cent of all cases) and a second peak in the late fifties and sixties (52 per cent of all cases). The disease is rare in the first and third decades. Giant-follicle lymphoma may occur at any age.

All forms of malignant lymphoma are commoner in men than in women.

GROSS PATHOLOGY

The most important thing to remember in regard to the pathology of these diseases is that virtually any organ may by involved, either grossly or microscopically. This simple fact explains the extraordinary protean character of the symptomatology of the malignant lymphomas. In general it may be said that, with certain important exceptions, the lymph nodes are almost invariably enlarged, either in the cervical, axillary, mediastinal, abdominal or inguinal regions. The spleen and liver are very commonly involved, and in decreasing order of frequency the pancreas, gastrointestinal tract, bones, skin, lung, heart, nasopharynx, breast, ovary and testicles. Involvement of the central nervous system is not rare.

Particular reference should be made to three systems other than the lymphatic. Secondary deposits in bone occur in some 25 per cent of all cases of Hodgkin's disease.[4] Similar involvement is uncommon in reticulum-cell sarcoma, and rare in lymphosarcoma. In Hodgkin's disease, the initial symptom may be due to destruction of bone, — even in the absence of obvious lymph-node involvement, — and the unwary physician may attribute the attendant pain to some hypothetical orthopedic condition and so fail to recognize the fundamental disease. More commonly metastatic bone lesions occur late in the disease. Although they are usually painful, extensive destruction may occur without pain and be discovered only by routine x-ray examination.

Malignant lymphoma of one form or another involves the gastrointestinal tract in approximately 25 per cent of all cases.[5] Such lesions are oftenest found in the stomach, duodenum or small intestine, less frequently in the large intestine or rectum. Unfortunately they are frequently multiple, and only rarely does one encounter isolated lesions that are susceptible of surgical removal.

Mediastinal involvement is frequent and well recognized. It is not so commonly appreciated that there may be diffuse parenchymatous infiltration of the lung, which may simulate a chronic non-suppurative pulmonary lesion.[6, 7]

CLINICAL PICTURE

It is highly important to recognize that the clinical symptomatology of this group of diseases is a most varied one. Almost any sign or symptom may appear. By far the commonest initial symptom is a painless lump, most often in the neck, much less commonly in the axilla and rather rarely in the inguinal region. There follows, in order of frequency, pain (commonest in the abdomen, back or legs), fatigue (unaccompanied by other symptoms), persistent sore throat, dyspnea, cough, fever, loss of weight, generalized itching and amenorrhea. Rarer initial symptoms are hoarseness, pain in the chest, diarrhea, paraplegia, hemoptysis, hematemesis, nasal obstruction, tinnitus, edema of the legs, anorexia, vomiting, deafness and melena.

The first symptoms vary in their relative frequency from group to group of the subdivisions. Eighty-five per cent of patients with Hodgkin's lymphoma complain initially solely of a painless lump. This symptom is present at onset in about three quarters of all patients with Hodgkin's granuloma, but in only one third of those with Hodgkin's sarcoma or reticulum-cell sarcoma. Pain is never present at the onset of Hodgkin's lymphoma but is found early in some 10 per cent of Hodgkin's granulomas, 25 per cent of lymphosarcomas and Hodgkin's sarcomas and nearly 40 per cent of

reticulum-cell sarcomas. These figures merely reflect the relative invasiveness of the individual types of lesions.

The fact that the enlarged lymph nodes are so often painless, together with the fact that not infrequently they appear following an acute upper respiratory infection and not rarely decrease or even disappear temporarily with subsidence of the infection, often lulls both the patient and the physician into a false sense of security. It must be remembered that in adults persistent enlargement of lymph nodes in absence of obvious cause is very rarely due to chronic inflammation alone.

As has been intimated above, the symptomatology is extremely varied, and once the disease has set in almost any symptom or sign may arise. Yet long periods of quiescence may follow appropriate radiation therapy, and this fact should not be construed as indicating actual freedom from disease.

Certain special features of the clinical picture should be referred to. Generalized itching without obvious cause may for some time be the only symptom of Hodgkin's granuloma. It is occasionally accompanied by a gradually increasing generalized bronzing of the skin, most marked in the axillary and gluteal regions.[8]

Skin lesions of the most diverse sorts may appear early or late in the course of any of the malignant lymphomas.[8] The association of bizarre skin lesions with lymphadenopathy should always arouse suspicion that one may be dealing with some form of malignant lymphoma.

Fever is common in Hodgkin's granuloma. Indeed it is rare to have a case of this disease run its course without an increased temperature at one time or another. Most frequently the fever is irregular, rising at night to 100 or 103°F. and falling to normal in the morning. Occasionally one encounters the so-called Pel–Epstein type of fever, in which the temperature rises daily over a period of a week or more, eventually reaching 103 to 105°F., and subsides as steadily and evenly to normal, only to rise again after a period of one or two months. Gradually the episodes of fever become longer and the intervals of freedom shorter. Once the temperature remains continually elevated, death is not far off. Such fever may be for months the only sign of the disease.[9]

The bone lesions so frequently appearing in malignant lymphoma have already been referred to. Their x-ray appearance is not diagnostic. Any bone lesion occurring in the course of generalized malignant lymphoma may properly be regarded as due to that disease. Their advent in Hodgkin's disease is usually heralded by pain in the involved bone or referred to the nearest joint. Occasionally when the vertebrae are destroyed, paraplegia and cord-bladder result. Bone lesions are of very serious prognostic importance, for death usually ensues about one year after their demonstration by x-ray except in cases in which the sternum is involved. The latter may do very well indeed.

Particular reference should be made to primary reticulum-cell sarcoma of bone.[10] This condition, which has only recently been recognized as a clinical entity, may occur at any age. Most frequently the long bones are involved, especially the femur, tibia and humerus. The clavicle is also a not infrequent site. The disease has in the past been mistaken for osteogenic sarcoma, Ewing's tumor, osteomyelitis and syphilis. The dangers of such erroneous diagnoses are obvious. Pain is the commonest symptom. The tumor grows quite slowly, and may reach massive size without seriously affecting the general health of the patient. In no other bone sarcoma is the contrast between the well-being of the patient and the size of the lesion so marked. The x-ray picture is not distinctive. Early there is mottled rarefaction of the bone. Later there is massive destruction, often with pathologic fracture. Although the tumor is radio-sensitive, it would appear that the most effective treatment is amputation followed by prophylactic radiation. In 11 of 16 cases subjected to amputation the patients were alive and well from six months to fourteen years after onset. Seven were alive and apparently free from disease ten years after onset.[10]

LABORATORY EXAMINATION

Neither reticulum-cell sarcoma nor giant-follicle lymphoma gives any distinctive blood picture, although a moderate degree of normocytic anemia may be seen in the former.

The relation of lymphosarcoma to lymphatic leukemia has already been alluded to. Occasionally a case may start as a pure lymphosarcoma and, with the passage of time, develop the classic blood picture of lymphatic leukemia. Much more rarely the reverse is true. In the latter cases, usually as a result of intercurrent infection, the white-cell count falls to normal and the differential becomes normal. In many cases of lymphosarcoma the percentage of lymphocytes in the peripheral blood is increased.

In Hodgkin's disease — of whatever type — sooner or later there are almost always changes in the peripheral blood picture. The white count is often moderately elevated (15,000 to 25,000) or more rarely depressed (500 to 3000). In either case the polymorphonuclear neutrophils are likely to be elevated. They may be markedly so (85 to 98 per cent). In rare cases the monocytes are increased

to a high degree (15 to 50 per cent). Eosinophilia exists rarely. A definitely abnormal white-cell picture in Hodgkin's disease usually indicates that the condition is widespread. A normocytic normochromic anemia almost always develops as the disease advances. The red-cell count may fall as low as 500,000. Not infrequently levels of 1,000,000 to 2,000,000 are reached. In absence of acute blood loss, anemia of this degree is extremely rare in any other type of lymphoma.

In all types of malignant lymphoma, the basal metabolic rate is elevated if the disease be sufficiently widespread. Levels of +20 to +50 per cent are not unusual, and even +110 per cent has been recorded. Determination of the metabolic rate is therefore of some diagnostic value.

A biopsy of one of the lymph nodes should be done whenever feasible. Without such a diagnostic procedure no accurate diagnosis can be made, and an accurate diagnosis is always of practical value to both the patient and the physician. It is important, however, to observe certain rules. An entire node should be removed. Cutting into a lymphomatous mass or removing part of a node may spread the disease. It is important to remove a node of sufficient size to assure an adequate histological picture. Small satellite nodes frequently show only chronic inflammation. Most important of all is the question of tissue fixation. A poorly fixed and stained section is worse than useless. It is remarkable how difficult it may be to make even a tentative diagnosis from poorly fixed tissue, and how easy it may be to make a specific and definite diagnosis when the same tissue is adequately prepared. If possible the tissue, in thin slices, should be immediately fixed in Zenker's fluid, run through paraffin and stained with eosin and methylene blue. If the patient is to be sent to one of the larger medical centers for treatment, it is as well to defer biopsy until it can be done in the hospital to which he is referred.

TREATMENT

It is a moot point whether surgery should ever be attempted in the group of malignant lymphomas, except for primary reticulum-cell sarcoma of bone, already referred to. In this disease it would appear to be unquestionably indicated. Many authorities believe that malignant lymphoma is always a generalized disease and that surgical intervention with a view to cure is therefore contraindicated. If, however, a case of Hodgkin's disease, particularly of the lymphoma type, be sharply limited to one area in the neck, if the patient's general condition be good and if the peripheral blood picture, sedimentation rate and basal metabolism be normal, it would seem proper to attempt the complete removal of the involved tissue. Such a procedure has been known to have resulted in "cures" of fifteen to twenty years' duration; but these cases are few and even after this lapse of time one cannot be entirely sure that the patient is free from disease. Still, radical surgery is worth attempting in carefully selected cases. In expert hands there can be but little danger. If the disease be truly limited and accessible, cure is possible.

X-ray therapy remains the standard method of treatment. The details of dosage should be left to the radiologist. There is some difference of opinion as to whether only obviously involved areas should be treated or whether all lymph-node-bearing regions should be subjected to radiation even though they do not appear to harbor any pathologic lesion. Jacox, Peirce and Hildreth[11] and Desjardins[12] advocate the latter or generalized form of therapy. The majority of workers believe that radiation should be applied to diseased areas only. The usual custom is to give from 200 to 800 r at 250 kilovolts in divided doses to the involved regions, repeating this dosage only when and if further indications arise, either by symptoms or by signs. In treating very large lymphomatous masses, especially those in the neck, mediastinum or abdomen, considerable caution must be exercised, for the first reaction of the diseased tissue is to swell, and thus strangulation may occur; furthermore, the rapid destruction of a large mass may flood the system with catabolic products capable of producing profound deleterious effects.

If there be marked anemia, blood transfusions must be resorted to before x-ray therapy is undertaken. The existence or development of leukopenia calls for extreme caution in radiotherapy.

Many authorities have held that x-ray therapy does not prolong life. This may be true if one considers only the average of a large series of treated and untreated cases, but there can be no doubt whatever that in individual cases life is materially prolonged, — this is particularly true of mediastinal involvement, — and Peirce, Jacox and Hildreth[11] appear to have shown conclusively that the life of even the average patient is materially longer after appropriate treatment. It may therefore be said that radiation is of very real and practical value, but that the details of such therapy should be left to a competent and experienced radiologist.

One must not lose sight of the fact that general medical care is of distinct value. Adequate food and plenty of fresh air and rest undoubtedly help. Iron in the form of ferrous sulfate is indicated in

the presence of anemia, although one should not anticipate any startling benefit unless there is an accompanying iron deficiency due to inadequate diet, bleeding or poor absorption. All obvious foci of infection should be removed and the greatest care taken to avoid any upper-respiratory infection. There is some evidence that vitamin D in large doses may be beneficial.

PROGNOSIS

In the average case of malignant lymphoma the patient lives two and a half years from the onset of symptoms. But no individual patient is the average, and, as has been indicated above, the various types of lymphoma carry with them quite different prognoses.

The average duration in the case of lymphosarcoma is slightly over two years; 80 per cent of the patients are dead within three years; very few survive more than ten years, although approximately 20 per cent live from three to ten years after onset.

Similarly, the average life of patients with reticulum-cell sarcoma is somewhat less than two years, and 17 per cent live from three to ten years, yet 2 per cent are alive and apparently free from disease from ten to twenty years from onset. Into the latter group fall patients with primary reticulum-cell sarcoma of bone appropriately treated.

In Hodgkin's disease, we find the most interesting data as to prognosis. The average duration of life from the first symptom in Hodgkin's lymphoma is two and a half years, yet nearly 30 per cent survive five years or longer, and nearly 20 per cent ten years or longer. In contrast, the average case of Hodgkin's granuloma lasts but a scant two and a half years and very few patients survive for over ten years; nearly three quarters are dead within three years. No individual with Hodgkin's sarcoma has in our experience survived a three-year period; the majority are dead within a year. This fact is entirely in accord with the neoplastic and invasive character of the condition.

It is difficult to give with any degree of accuracy the duration of the disease embraced under the term giant-follicle lymphoma, since this type so often progresses into one of the others, at which time it of course takes on the prognostic implications of that type. In general, however, it may be said that cases of giant-follicle lymphoma have a better prognosis than the other types, save only Hodgkin's lymphoma. The average duration is four years; many patients live from six to twelve years.

• • •

Malignant lymphoma is a protean disease whose signs and symptoms are legion. The intermittently progressive course may be prolonged and the symptoms alleviated by appropriate treatment. True cures, if they occur, are rare, yet this fact should not prevent our using to the fullest extent all those measures now at our disposal for combating this dread condition.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 25011

PRESENTATION OF CASE

A fifty-two-year-old, white, married bus driver was admitted complaining of epigastric pain.

Four and a half months before admission he experienced the gradual onset of a sensation of pressure under his xiphoid and fullness after meals. Increasing constipation began at the same time. He gradually stopped heavy foods and overeating and drank more and more milk. Activity made him feel quite well, whereas resting gave an increased sense of pressure in the epigastrium. Four weeks preceding entry pain was first noted in the form of steady, severe epigastric pain about two hours after meals, when he believed he could not take food. Hot water bottles gave him the most relief. During this time his stools were yellow, never bloody or tarry. Two weeks before admission he noted increased gaseous distention and at 2 a. m. was awakened by pain which was not relieved until the hot water bottle had been applied for a half hour. This pain recurred from time to time. It did not radiate, did not extend to the back or shoulders and was not cramping in nature. The patient worked during the last week and on the fourth day developed an upper respiratory infection. Three days before entry he saw a child killed; this completely unnerved him. He had not vomited and had not had jaundice or abnormal stools. He had had no urinary symptoms.

For the past six months he had been relatively deaf in the right ear but had had no symptoms of otitis. Two years before he had had a transurethral prostatectomy, and eight years before that a tonsillectomy. At the age of seventeen years he had had typhoid fever.

Physical examination showed a thin, chronically ill man with evidence of weight loss. A hard 2 cm. nodule was palpated in the region of the left anterior cervical lymph nodes. Both the infraclavicular and supraclavicular fossas were depressed. Examination of the chest was negative. The blood pressure was 100 systolic, 65 diastolic. There was moderate tenderness over the midepigastrium, but no palpable masses or organs. Rectal examination was negative. The extremities were negative.

The temperature was 100.6°F., the pulse 110, and the respirations 20.

The urine examination was negative. The blood showed a red-cell count of 5,000,000 with 90 per cent hemoglobin, and a white-cell count of 17,000 with 80 per cent polymorphonuclears, 18 per cent lymphocytes and 2 per cent mononuclears. The serum nonprotein nitrogen was 19 mg. per cent, the protein 5.8 gm., and the chlorides were equivalent to 98 cc. of N/10 sodium chloride. A blood Hinton test was negative. Gastric analysis on two occasions showed no free acid, even after histamine. Four stool examinations were guaiac positive.

X-ray films of the gastrointestinal tract showed an irregular swelling involving the prepyloric region of the stomach, as well as the first and second portions of the duodenum. The third portion showed some swelling in its proximal portion. Questionable ulceration was present in the second portion. There apparently was ulceration in some of the involved areas, particularly in the lower part of the second portion of the duodenum where there was an irregular cavity, filling only at times. The third portion was at times narrowed and when filled showed an apparent pressure defect on the outside. The adjacent loop of jejunum showed localized swelling. This lay several loops distal to the ligament of Treitz but in close proximity to the third portion of the duodenum. The involved area was sharply defined and was approximately 7 cm. in length. This part of the jejunum was rigid and its mucosal pattern destroyed, apparently due to ulceration. Its position was fixed. There was probably an extraluminal soft-tissue mass pressing on the duodenum. Transport through the small intestine was delayed. The ileocecal valve was not reached at the end of five hours.

On the fifth hospital day the patient vomited some greenish coagulated milk. On the tenth day a walnut-sized node was palpated in the right lateral chest wall. He vomited again on the tenth night. The stools were guaiac positive. He was having no pain. On the thirteenth day he had a chill and epigastric pain, and felt weak and feverish. The pain did not radiate to the shoulders. The temperature was 102°F. The abdomen was tense. He vomited, but the vomitus did not contain blood. The following day he vomited 200 cc. of greenish liquid. During the next two weeks his temperature varied between 98.6 and 102°F. daily. His condition remained essentially unchanged.

On the thirty-third hospital day an operation was performed.

Differential Diagnosis

Dr. Walter Bauer: From the history alone one can say that we are dealing with a man of fifty-two years of age who had symptoms referable to the upper gastrointestinal tract. There were no symptoms of obstruction. However, it should be pointed out that this man finally placed himself on a diet of soft-solid food and liquids. I gathered that milk had constituted the greatest portion of his dietary. This may be one reason for there having been no symptoms suggesting obstruction. The location of the pain and its character are of no help in deciding in favor of one lesion of the upper abdomen as compared with another. It evidently was a constant pain. My impression is that the pain was more like that encountered in cases of infiltrating lesions of the wall of the stomach or intestine. From the history alone I should have considered cancer of the stomach, ulcer, gastritis and perhaps pancreatitis or cancer of the pancreas as diagnostic possibilities.

From the physical examination we learn that he had lost weight, that a nodule was felt at the lower end of the chain of anterior cervical lymph nodes and that the stools were guaiac positive. With this information one might reasonably conclude that he was dealing with an ulcerating lesion of the gastrointestinal tract. The presence of the nodule plus the weight loss favors the presence of cancer of the upper gastrointestinal tract rather than that of a gastritis or a gastric or duodenal ulcer. The nodule felt in the neck was evidently an enlarged, firm lymph node but not the typical sentinel gland of cancer of the thoracic or abdominal cavity. This finding does not help us appreciably because the patient was of the age group where it is commonly encountered. It may be used, however, as evidence in favor of cancer. I cannot see much reason to suspect that the symptoms in this individual were being caused by any type of infection, such as tuberculosis or regional ileitis. Syphilis might be suspected but it would be difficult to prove that we were dealing with a syphilitic lesion. The question to be answered is, What type of lesion did the roentgenologist observe in this man? From here on I think the differential diagnosis could probably be carried on much better by the roentgenologist than by myself. We must decide whether we are dealing with a malignant lesion of the upper gastrointestinal tract. If so, is it intrinsic or does it represent invasion from a neighboring organ?

I wonder if Dr. Schatzki would show us the x-rays. I should like to know, first, whether the stomach emptied normally.

Dr. Richard Schatzki: I do not remember whether it emptied normally. Certainly there was no obstruction at the pylorus. The peculiar thing was that this patient did not have a real pylorus. In other words there was no clear-cut narrowing between the stomach and the first portion of the duodenum, such as usually indicates the position of the pylorus.

Dr. Bauer: Would you say there was involvement of the pylorus?

Dr. Schatzki: There is a lesion involving the prepyloric region, and the greater portion of the duodenum, in fact all of it that one can see, that is, the first and second portions and the beginning of the third portion. Needless to say, this is a very unusual appearance. The second portion is perhaps slightly less involved than the first.

Dr. Bauer: Can you point out the ulcer in the second portion of the duodenum?

Dr. Schatzki: This area here is ulcerated. There is no mucosal pattern.

Dr. Bauer: That is not duodenum, is it?

Dr. Schatzki: It is the junction of the second and third portions of the duodenum. The peculiar thing about the first portion as well as the stomach and immediate prepyloric region is that there are what appear to be folds, but the folds are much thicker than they usually are in this area. They are also much more irregular, and the surface appears to be destroyed.

Dr. Bauer: In other words you would say there is ulceration of a large portion of the mucosa of the duodenum.

Dr. Schatzki: Yes, with marked swelling.

Dr. Bauer: With involvement of the jejunum as well?

Dr. Schatzki: The jejunum is involved here. The distal part of the third portion of duodenum is not involved and the upper region of the upper loop of the jejunum is not involved, but there is one loop which is in close proximity to the duodenum and shows involvement over an area of 7 cm., with definite destruction of the mucosa.

Dr. Bauer: With an area in between that you think was normal, or was there contiguous involvement?

Dr. Schatzki: No, not contiguous so far as the course of the intestine is concerned, though the involved loop was in close proximity to the diseased duodenum.

DR. BAUER: The disease involved the prepyloric region, the first and second portions of the duodenum and about 7 cm. of the jejunum. Is that correct?

DR. SCHATZKI: Yes.

DR. AUGUSTUS S. ROSE: Was a barium enema done?

DR. SCHATZKI: Not to my knowledge.

DR. BAUER: It would be a help to know whether a pressure defect did or did not exist.

DR. RICHARD H. SWEET: There was a definite pressure defect. The other films looked as though the duodenum were pushed aside.

DR. SCHATZKI: You can see the defect around the involved loop, where it was pressed on by the soft-tissue mass. I think I ought to make that clear. This loop has a definite intrinsic lesion in addition to the definite mass that is around it.

DR. BAUER: If I were to be absolutely honest I should be forced to say I cannot make a definite diagnosis. However, I shall proceed as though I could.

It is obvious that we must try to decide whether we are dealing with an intrinsic lesion or an extrinsic one that has invaded the previously mentioned portions of the gastrointestinal tract. I do not believe that we have to consider the possibility of a prepyloric carcinoma very seriously, because extensive involvement of the duodenum and ileum does not occur in such cases. If we were to think in terms of cancer outside the gastrointestinal tract which has invaded the upper portion of the tract we should have to consider carcinoma of the gall bladder, pancreas or duodenum. If this patient had involvement of the duodenum secondary to carcinoma of the gall bladder or pancreas he probably would have been jaundiced. In addition we might expect to feel a mass. Primary carcinoma of the duodenum is a very rare disease. If it involves the second portion of the duodenum, it usually arises in the ampulla of Vater. If this patient had this type of lesion we should again have expected to have observed jaundice. The biggest argument in favor of either of these diagnoses is the fact that Dr. Schatzki feels quite certain that he was able to demonstrate a pressure defect.

I am inclined to stick to the possibility that we are dealing with an intrinsic lesion of the gastrointestinal tract and not an extrinsic one. The one diagnosis that best explains everything in this case is malignant lymphoma of the lymphosarcoma type, even though there is very little on physical examination to substantiate such a diagnosis. He did have one enlarged anterior cervical node and during his stay in the hospital developed a walnut-sized node on the chest wall. The patient had a fever which is consistent with this diagnosis. He had a leukocytosis, and there were 80 per cent polymorphonuclear leukocytes. This diagnosis better explains the findings in this case than any other that I can think of. I shall say that this patient probably had a malignant lymphoma of the lymphosarcoma type, involving the duodenum and a portion of the jejunum.

I should like to hear further suggestions or comments.

DR. TRACY B. MALLORY: Would anyone care to suggest an alternative diagnosis?

DR. BAUER: A luetic lesion might be suspected. I can go no farther.

DR. WYMAN RICHARDSON: You can have intrinsic malignant tumors of a sarcomatous type other than lymphoma.

DR. BAUER: Yes. I thought of the possibility of leiomyosarcoma because one does encounter cases with several such lesions in the gastrointestinal tract. I did not appreciate, however, that the lesions were quite as extensive as they apparently were in this instance.

DR. JAMES H. MEANS: I shall make a statement and must beg of you to believe that I am truthful. As Dr. Bauer read this case I did not recognize it as one that I had recently seen. I did not become conscious of that until Dr. Mallory handed me the clinical record just now. It seems to bear out what is apparently true, that it is sometimes easier to make a diagnosis from an abstracted record than from seeing the patient. I had no difficulty in making the diagnosis of lymphoma just now, but in looking over the complete clinical record it appears that when the patient went to operation after being under my care, I had not the faintest idea what the diagnosis was. So it would seem that the patient was actually more puzzling than the paper case that has been summarized for this meeting.

DR. SWEET: I should like to elaborate on what Dr. Means has said. One clinical aspect which is barely mentioned in the case history and on which our whole attention was focused for the subsequent two weeks was whether he had a penetrating ulcer. On one occasion the surgical resident was summoned to consider whether the patient had to be operated on immediately because he was so tender and had so much spasm in the right upper quadrant.

DR. BAUER: Was this before or after this x-ray evidence?

DR. SWEET: I do not know. I think I was the first surgeon to see him, and at the time he had spasm and tenderness and all the clinical aspects of a penetrating duodenal ulcer. On going over the history and learning about the absent acidity

and other aspects of the case I considered a penetrating carcinoma, but we finally agreed that he must have a penetrating ulcer. I was ill for a period after that, and Dr. Churchill saw him. He made a diagnosis of penetrating ulcer and decided that surgery was indicated after the lesion had quieted down.

The lesion did quiet down, and after a considerable period we operated and found what we thought from gross inspection was an ulcer of the first portion of the duodenum which had penetrated, almost perforated and had been walled off by the adjacent tissues. The liver and adjacent portions of the omentum were adherent and rather edematous, and inflammatory in nature. I thought the course of wisdom was not to disturb this. The astonishing thing was that in the retroperitoneal tissues and in the mesentery he had an immense amount of thickening and a great mass in the base of the mesentery, which was nodular. There were several isolated nodules which looked like enlarged lymph nodes. This mass extended from just above the promontory of the sacrum up along the aorta to the region of the duodenal loop and distorted the second and third portions of duodenum. I took out two lymph nodes, one of which was the size of a small walnut and appeared to be lymphomatous. I then did a gastroenterostomy because of what looked to me like potential, if not actual, obstruction at the pyloric region. I made diagnoses of retroperitoneal lymphomatous tumor and probable duodenal ulcer, which had penetrated. I could not be sure that the mass which I saw and felt in the duodenum was lymphoma.

Dr. Benjamin Castleman: I think it is only fair to the X-ray Department to say that before the operation they made a diagnosis of lymphoma.

Dr. Mallory: It seems to me the most helpful point in the clinical findings was the total absence of acid in the gastric contents. I think that duodenal ulcer under those circumstances is impossible.

Clinical Diagnoses

Lymphoma of small intestine.
Duodenal ulcer with perforation and abscess?

Dr. Bauer's Diagnosis

Malignant lymphoma of the lymphosarcoma type, involving the pylorus, duodenum and jejunum.

Anatomical Diagnoses

"Hodgkin's sarcoma" of stomach, duodenum and jejunum.
Operative wound: anterior gastroenterostomy, enteroenterostomy.
Abscess of lung, right lower lobe.

Pathological Discussion

Dr. Mallory: We found multiple areas of lymphomatous involvement in the duodenum and jejunum. Two separate areas of jejunum were affected, and there was a considerable degree of erosion in both places at the time he died. However, the mass of retroperitoneal nodes that Dr. Sweet noted and biopsied showed no evidence of tumor, and that is a point I think worth emphasizing. I believe that in every case of lymphoma of the gastrointestinal tract which we have seen the regional nodes have been very large but have never shown anything but inflammatory hyperplasia. You cannot biopsy a mesenteric lymph node from a case of lymphoma of the gastrointestinal tract and count on getting histological verification of the diagnosis. Such nodes always show simple inflammatory hyperplasia. That was the case here. The one other finding was a small abscess in his lung, which seemed to be of considerable duration; I think it very likely antedated the exploratory operation.

Dr. Sweet: This man made a quite uneventful recovery so far as the operation was concerned. He was almost ready to go home when he had a massive hemorrhage which was the cause of his death. This to my mind tends to confirm the diagnosis because, in my experience, so many cases of lymphoma of the gastrointestinal tract have had massive bleeding.

Dr. Grantley W. Taylor: Did the supraclavicular lymph node show evidence of metastasis at autopsy?

Dr. Mallory: We unfortunately did not examine it.

Dr. Means: I think that it ought to be pointed out that the cervical lymph nodes should have been biopsied. That was the glaring error in this case.

Dr. Mallory: They would probably have been negative. In these cases where lymphoma is sharply localized to the gastrointestinal tract one usually does not find tumor elsewhere.

Dr. George A. Marks: Is it possible to say that the tumor was primary in the duodenum, or was it all in the mesentery?

Dr. Mallory: It was in the wall of the bowel in all three areas, with some infiltration of the mesentery as well. We had an argument in the laboratory as to the histological classification of the tumor because it was rather undifferentiated. We thought it was probably so-called "Hodgkin's sarcoma."

CASE 25012

Presentation of Case

A fifty-five-year-old, white, married Belgian bartender was admitted complaining of chronic, recurrent symptoms of peptic ulcer.

He was perfectly well until twenty to twenty-five years before entry when he developed mid-epigastric pain which occasionally extended through to the back, occurring after meals and regularly relieved by food or alkalies. He had periods of remission and relapse, the latter occurring usually in the early spring and late fall. X-ray films were taken from time to time, the first about twenty years before admission, the last a year before admission. Each time an ulcer was demonstrated. The last films demonstrated a "new" ulcer. During the summer before admission he had his usual remission and was well until six weeks before entry when his autumnal exacerbation began. A Sippy regime gave little relief. The pain was severe, especially at night, so that he could not sleep for more than two hours at a time. He had tarry stools on only one occasion, and this was attributed to medication. There had been no pain in the region of the shoulders or lower abdomen. He had had no nausea or vomiting, and his appetite had been good. He had lost no weight, his best weight being that on admission — 170 pounds. Although he was a bartender he stated that he very seldom took a drink. He smoked a moderate number of cigarettes. His work had always been light. His family history was noncontributory.

Physical examination showed a moderately obese male in no distress. Examination of the head, chest, abdomen and extremities was negative. The blood pressure was 160 systolic, 100 diastolic.

The urine examination was negative. The blood showed a red-cell count of 4,880,000 with 90 per cent hemoglobin, and a white-cell count of 11,100 with 67 per cent polymorphonuclears. The nonprotein nitrogen of the serum was 22 mg. per cent, the protein 6.2 gm. and the chlorides were equivalent to 100 cc. N/10 sodium chloride. A blood Hinton test was negative. A gastric analysis showed 55 units of free hydrochloric acid, and the contents were guaiac negative. A stool examination was guaiac negative.

A gastrointestinal x-ray series showed marked constriction of the lesser curvature of the stomach and a deep ulcer crater in the middle third of the lesser curvature, measuring 1.6 cm. in depth and 1.7 cm. in width. There was moderate surrounding induration, but the mucosa appeared normal except for convergence to the crater. There was considerable spasm of the antrum and first portion of the duodenum, which showed a slight deformity without evidence of a crater.

During the first six days in the hospital the patient had pain only once or twice daily, which was much less severe than previously, his symptoms being well controlled by a bland diet.

On the eighth hospital day an operation was performed.

Differential Diagnosis

Dr. Marshall K. Bartlett: I wonder if Dr. Schatzki will show the films?

Dr. Richard Schatzki: These pictures show exactly what the report describes — a large crater approximately 5 cm. away from the pylorus. There is some induration around the crater such as you see in any large ulcer, as well as shortening of the lesser curvature, which is a sign of chronicity. There is also marked convergence of the rugae. In other words the gross picture is that of peptic ulcer.

Dr. Bartlett: Dr. Schatzki has outlined the problem quite clearly. We have an ulcer on the lesser curvature, and we must decide whether it is benign or malignant. One of the interesting points in that regard would be to know whether this recurrent ulcer which this man had had for twenty years had always been in the same location or whether he had formerly had a duodenal ulcer and at entry had a gastric ulcer. I do not see that there is anything in the history that could lead us to assume he had two separate lesions. The only suggestive point is the statement in the history that the x-rays which were repeated periodically before admission showed a "new" ulcer shortly before entry.

What have we in favor of the lesion's being cancerous? We have the facts that he may have had an ulcer in this region for a long time, twenty years, and that he had a relatively large ulcer in the portion of the stomach where we know malignant disease is apt to occur. In favor of its being a benign lesion we have the facts that he was in good general health, had lost no weight, had no anemia and had free hydrochloric acid in normal amounts. The gastric contents were negative to the guaiac test, as was the stool. Of course both were single examinations and are not conclusive, but perhaps they are slightly helpful. In addition to that we have the x-ray evidence which seems to me to suggest a benign lesion rather than a malignant one. If it is malignant I suppose it is probably a carcinoma. It would seem to be more likely that this lesion on the lesser curvature is a benign ulcer.

Dr. Horatio Rogers: I think that the dramatic change in the character of the symptoms and the failure to respond to medication, which had hitherto been successful, are points in favor of the lesion's being malignant.

Preoperative Diagnosis

Benign gastric ulcer.

Dr. Bartlett's Diagnosis

Benign gastric ulcer.

Anatomical Diagnosis

Colloid carcinoma of stomach, with peptic ulceration.

Pathological Discussion

Dr. Tracy B. Mallory: The patient was operated on by Dr. Arthur W. Allen, with a preoperative diagnosis of a benign ulcer. He found a large penetrating ulcer on the lesser curvature. He also found a very definite old ulcer in the duodenum with adhesions and marked scarring around it. He excised the stomach ulcer. Grossly it was almost the same shape as the lesion that you saw in the x-ray film. There was a very deeply penetrating rather narrow crater. Microscopically the mucous membrane on either side looks at first glance to be quite normal, but when one focuses down with high power on the undermined edges one finds that the underlying tissue is full of small, signet-ring cells filled with mucin, and there is no question that it is malignant. The infiltration extends a considerable distance on each side of the ulcer; in fact I am doubtful whether the resection was extensive enough to have removed the growth.

The question comes up again as to whether this represents cancer developing in a chronic ulcer or is a primary carcinoma with a secondary peptic ulcer in the center of the lesion. I do not believe in this particular case it is possible to reach an absolute decision, but the base of this ulcer does not look extremely chronic. It is consistent with a lesion of a few months' duration but not, I should say, with one of twenty years' duration, and we have definite proof from the surgical exploration that he had an old duodenal ulcer. I am inclined to think he had a duodenal ulcer for twenty-five years and developed cancer of the stomach a few months before he came to operation. I do not believe there is any possible way in which the preoperative diagnosis could have been made, either clinically or by x-ray.

Dr. Schatzki: How do you explain the marked scarring in the stomach, resulting in marked shortening of the lesser curvature? If it was a primary cancer we should not expect such changes in so short a time.

Dr. Mallory: This is a signet-ring, colloid carcinoma of the scirrhous type, which eventually produces linitis plastica. Fibrosis is a characteristic feature and characteristically contracts and stiffens the stomach wall.

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REPORTS ON MEDICAL PROGRESS

In this issue of the *Journal* a new series of "Reports on Medical Progress" begins. The object of a review of this sort is to inform the general practitioner in regard to the newer, approved methods in the diagnosis and treatment of disease, but the members of the editorial board are of the opinion that the majority of our former progress reports failed in their purpose. Some chiefly consisted of a listing of titles, with no critical evaluation of the papers by the author of the review. Others called attention to methods of diagnosis and treatment that were in the experimental stage. While it is true that such reviews have their place in medical literature, the busy physician does not have the time to refer to the original articles, nor is he able to separate "the wheat from the chaff" in subjects with which he is unfamiliar.

The new reports, which will appear weekly, are limited to approximately three thousand words. They do not represent meticulous reviews of the literature, but rather those particular aspects of each subject that, in the opinion of the reviewer, — who has been carefully selected, — are of proved value to the general practitioner in diagnosis and treatment. A few references are included for the use of those who wish to read extensively. In other words, the reviews represent what authoritative persons would say in a series of informal talks.

All but seven of the men who were originally asked to contribute to the series have agreed to do so; for this the *Journal* is duly grateful. Each review represents time and effort on the part of the reviewer that are generously contributed for the purpose of furthering postgraduate medical education. Any suggestions from our readers in regard to the value, form or subjects of these weekly reports will be received with appreciation and interest.

THE LEGAL STATUS OF CONTRACEPTIVE ADVICE IN MASSACHUSETTS

For many years Massachusetts physicians have sought to protect the lives and health of their private patients by giving them contraceptive advice when, in their opinion, pregnancy was temporarily or permanently contraindicated. It became evident however that a far from negligible proportion of the women of Massachusetts — those who had no private physician and who belonged to the "outpatient" class — were forced either to deny themselves to their husbands or to risk their lives or health by becoming pregnant.

In 1931 an attempt was made to amend the law so that physicians might be exempt from its restrictions when, in their opinion, there was good evidence that pregnancy might be dangerous to the patient's life or health. This attempt failed.

In 1932, after being advised by a well-known law firm that the legal restrictions would in all likelihood not be construed as applying to physi-

cians in the bona fide practice of their profession, the Birth Control League of Massachusetts was instrumental in establishing the Mothers' Health Office in Brookline. The office was conducted by a qualified physician, under the supervision of a board of medical consultants; advice was given only to married, non-pregnant women whose physical or mental condition contraindicated pregnancy. For five years this office carried on without molestation; patients were referred by the leading hospitals of Boston, by private physicians and by social agencies. By 1937 similar offices had been opened in Boston, Fitchburg, New Bedford, Springfield, Worcester and Salem.

On June 3, 1937, the Salem office was visited by the police; confidential records were taken and the physician in charge, the nurse and two social workers were arrested on the charge that they "did sell, lend, give away, exhibit or offer to sell, lend or give away instruments and other articles and drugs and medicine for the prevention of conception." The attorney for the defense did not deny that the defendants had done these things, but contended that the prohibitions contained in the statutes did not apply to physicians and to those working under their direction when contraceptive advice was given for the purpose of protecting health and saving life.

Judge Sears, before whom the case was tried, stated in effect that he had no doubt the defendants had been actuated by worthy motives, but that it was not within his power to interpret the law contrary to its obvious meaning. He therefore found all the defendants guilty. This decision was sustained in the Superior Court and was then appealed to the Supreme Judicial Court of the Commonwealth. Chief Justice Rugg, who handed down the decision, said: "We think that such an exception cannot be read into our statute by judicial interpretation. . . . The relief, here urged, must be sought from the law-making department and not from the judicial department of government."

The case was then appealed to the United States Supreme Court on the ground that the Massachusetts statutes violated the first article of the State Constitution of Massachusetts and the fourteenth amendment of the Constitution of the United States. On October 10, 1938, the Supreme Court refused to review the case on the technical ground that there was a "want of a substantial federal question."

These decisions give to Massachusetts the distinction of being the only state in the Union in which the existing laws have interfered with the medical advice that a physician is entitled to give to his patients. A number of physicians in this state appear not to realize their significance. These rulings affect not alone marital happiness, the health of women and the well-being of children, but even more fundamentally, they strike at the right of the individual physician to use his knowledge for the benefit of his patients.

Possibly the existing statutes will be reinterpreted in the light of new test cases that place the basic issue more clearly and directly before the courts. Failing that, the law must be amended. In any event, the public must become better informed regarding the facts involved. Too many people believe that birth control predicates abortion, that the avoidance of dangerous pregnancy is merely a matter of self-control. The dissemination of contraceptive information belongs by right to the medical profession; it should not be bootlegged as it is now, nor have to be given by physicians in defiance of the law.

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SECTION OF OBSTETRICS AND GYNECOLOGY

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PLACENTA ACCRETA

Mrs. M. B., a thirty-four-year-old primipara, started to bleed February 4, 1936, three days after delivery.

The family history was essentially negative. The patient had had a ruptured appendix as a child, and her tonsils were removed twice. She had had the usual childhood diseases, including diphtheria. Catamenia began at thirteen, were

A series of selected case histories by members of the section will be published weekly.

Comments and questions by subscribers are solicited and will be discussed by members of the section.

regular with a twenty-eight-day cycle, lasted four days and were unaccompanied by pain. Her last period was April 6, 1935, which made her expected date of confinement January 13. She had had no complications during her pregnancy, and a blood Wassermann test was negative.

After a normal, primiparous labor lasting about five hours and a half, she was delivered by simple forceps because of an unusual amount of bright show. This was subsequently found to be due to a partial separation of the placenta, as there was a clot adherent to the separated area. The placenta was delivered normally and was apparently intact. There was no unusual bleeding after delivery.

Three days later she began to bleed profusely; the hemorrhage was so marked that within an hour her blood pressure had gone down to 70 systolic. Five hundred cubic centimeters of glucose and 500 cc. of her husband's blood were given before any attempt was made to ascertain the cause of the bleeding. On examination there was no bleeding from the cervix. Exploration of the uterus revealed a tongue-like piece of tissue hanging down from the posterior wall up toward the right horn. Part of this was removed by forceps and some was obtained by curet; the uterus was packed with an iodine strip. At the end of the operation her pulse rate was 100 and her color was satisfactory. No laboratory work was done on the patient's blood until two days later. At that time the hemoglobin was 35 per cent, the white-blood-cell count 19,400, and the red-blood-cell count 1,740,000.

The next day, February 7, she began to bleed again, but the hemorrhage was not profuse. However, since her blood pressure fell from 120 to 100 systolic during the next hour, hysterectomy was decided on. Transfusion was deferred until the end of the operation. No blood examination was made until the following day when the hemoglobin was 45 per cent, the white-blood-cell count 86,000, and the red-blood-cell count 2,820,000. She made a satisfactory convalescence, although she ran an elevated temperature for five days after operation.

The subsequent laboratory work on her blood was as follows: February 9, white-blood-cell count 53,000; February 10, hemoglobin 45 per cent, white-blood-cell count 18,800, red-blood-cell count 2,100,000; February 15, hemoglobin 50 per cent, white-blood-cell count 20,700, red-blood-cell count 2,860,000; February 21, hemoglobin 55 per cent, white-blood-cell count 13,500, red-blood-cell count, 2,900,000; February 26, hemoglobin 65 per cent, white-blood-cell count 8,800, red-blood-cell count 3,620,000.

The following is the pathological report:

The specimen consists of a postpartum uterus, fixed in formalin, which has been opened anteriorly by a midline vertical incision. The specimen measures 12 cm. in width, 12 cm. in height and 6.5 cm. in thickness. The myometrium is of normal color and consistence for a formalin-fixed postpartum uterus. The myometrium measures 2.5 cm. in thickness. The placental site is at the fundus, mostly posteriorly. There are irregular, small masses of placental tissue, the largest of which is 2 cm. in diameter and is located in the region of the right cornu. There are thrombosed sinusoids in the immediate neighborhood of the placental site, which in the fixed condition and the contracted state of the uterus measures approximately 5 cm. in diameter. The rest of the lining of the uterus, composed of decidua vera, is dirty greenish-grey and of irregular contour. On gross examination, the findings

Figure 1. *Section through Placental Site (× 17).*

suggest those of placenta accreta, particularly in view of the fact that the spongy decidual reaction appears to be very slight in the right cornu. Multiple vertical incisions in the uterine wall reveal no other areas of adherent placental tissue. On microscopical examination, a section taken from the region of the right cornua and one somewhat removed from there, both show adherent placental tissue (Fig. 1).

Diagnosis: postpartum uterus, with evidence of retained placental tissue (placenta accreta).

Comment. Postpartum hemorrhage that occurs a few hours or longer after delivery must always be due to one of two conditions: the slipping of sutures placed in a torn cervix or repaired perineum, or uterine bleeding due to retained placental tissue, possibly an accreta. The diagnosis cannot be made except by examination. In this

case there was no bleeding from the episiotomy wound and the cervix had not been sutured at the time of delivery; hence the bleeding must have come from the inside of the uterus.

The commonest cause of postpartum uterine bleeding is a cotyledon or a succenturiate placenta that is adherent and not expelled at the time of delivery; but a placenta accreta is sometimes found to be responsible. The diagnosis rests on intrauterine investigation. In this case examination proved that retained placental tissue was the cause of the bleeding, and since this could not be removed either by the finger or by instrumentation, it was inferred that a partial accreta existed. The packing of the uterus was done to control subsequent bleeding and also in the hope that this piece of placental tissue might be normally extruded. Subsequent hemorrhage, however, made operation necessary, and hysterectomy seemed to be the only means of adequately controlling the bleeding and of removing the cause at the same time. It was unfortunate that the uterus had to be sacrificed in a woman only thirty-four years of age, but pathological examination proved this to have been the intelligent procedure.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning January 9:

BRISTOL SOUTH (New Bedford Section)

Friday, January 13, at 4:00 p. m., at the St. Luke's Hospital, New Bedford. Subject — Sepsis. Instructor: A. Gordon Gauld. Robert H. Goodwin, *Chairman*.

WORCESTER

Tuesday, January 10, at 8:30 p. m., in the Nurses' Home of the Milford Hospital, Milford. Subject — The Control and Treatment of Respiratory Infections. (This is to include the serological treatment of pneumonia in infants and children.) Instructor: Charles F. McKhann. Joseph Ashkins, *Chairman*.

A MEANS OF IMPROVING THE DISTRIBUTION OF MEDICAL CARE IN MASSACHUSETTS*

We have of late been hearing much to the effect that the executive branch of our federal government seems committed to a policy which would greatly enlarge government's participation in the care of the sick. This is food for deep and earnest thought, particularly as some of the changes contemplated call for a radical and revolutionary departure from the present control of the distribution of medical care.

We may ask ourselves two questions as touching on the wisdom of these new proposals. First, Is the present set-up of medical care so basically wrong and so outdistanced by the present social order that even its modification will not suffice? Secondly, Is there a middle road which, while preserving all that is good in American medicine, will at the same time take due notice of its shortcomings and voluntarily seek the means of their correction? The great majority of the people, who have thought of this matter at all, earnestly desire and hope for the accomplishment of this latter. May I present to you today a program which bids fair to bring about this very desirable end?

This program is founded on the studies of the Massachusetts Medical Society as to the present medical needs of the people of our state. There has come from these studies the firm conviction that, whatever may be the condition in certain other parts of our country, there is today in Massachusetts no serious lack of medical facilities. The problem has almost entirely to do with such improvement in the distribution of our present facilities as will make them more readily available to all. This implies, in the first instance, a program of public education in the value of good health. This program should start with the child and continue as a very important part of his school curriculum. If further emphasis is needed as to the importance of this latter, let me point out that our studies showed that, of those inadequately cared for in Massachusetts, nearly half were poorly cared for because of their own indifference. It appears that it is not enough merely to offer free medical care to those who cannot afford to pay for it. An appetite for good health must be created. A bounteous meal means nothing to the man who has no desire to eat.

This matter of educating boys and girls in the value of good health and in the means of preserving it does not involve the setting up of any new machinery. Rather does it seek to place greater emphasis on, and to promote a greater utilization of, machinery already existent. Massachusetts school systems have, for approximately three decades, provided for the medical inspection of the children in their keeping. The greater utilization of this machinery along the lines of educating these children in the value of good health is an opportunity for closer co-operation between school authorities and their medical personnel.

The medical needs of the indigent should be supported out of tax funds just as the food, clothing and housing needs are now provided. The indigent patient should be treated as an individual patient by the doctor of his own choice. The payment for such services should be by agreement between local welfare authorities and local medical societies. I know full well that the responsibility for the medical care of the poor is the traditional role of the doctor. In this crisis through which we are passing, however, this load lays a heavy burden on a profession which is already supplying its proportional share of direct and indirect tax funds. This double system of taxation has for many about reached the point of exhaustion. This responsibility belongs to the whole people, and not to any particular group.

The principle of insurance against the unpredictable hazards of life should be utilized by the low-income and moderate-income groups as a means of financing the cost of their medical care. These groups represent the great bulk of our population. The practice of doctors to scale down their charges to meet these lesser pocketbooks has, we are told, not met the whole problem. Neither is it enough to say that those with such incomes should budget in the ordinary way to meet the costs of sickness. Many of such incomes are so small as to make the ordinary type of budgeting impossible. Again, if we are to be practical

*A "Green Lights to Health" broadcast given by Dr. Michael A. Tighe on Wednesday, December 14, and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

in this matter we must admit that the number of people who do and who will budget to care for such an unpredictable thing as sickness is very small indeed. Rarely does the individual anticipate being ill. Illness is for the other fellow and not for him.

Hence, another type of budgeting to meet the costs of illness becomes necessary: a painless type of budgeting, a type of budgeting which, while recognizing the demands of pressing and immediate needs and the lure of the many useful things which go to make up American life, still may set aside weekly, in an insurance system, the price of a movie as the premium to pay for adequate medical care.

Part of the machinery for bringing this about has already been set up. The Associated Hospital Service Corporation began its operations a little over a year ago. This is a non-profit organization authorized under a special act of the Massachusetts legislature. The organization is already meeting the problem of hospital costs for many thousands of our people. The selection of the policyholder under this contract has been careful — too careful is the criticism of many. It must be remembered, however, that this was virgin soil and that the interests of the policyholder must be protected against any contingency. An examination of the financial reports of this Massachusetts corporation and of others, notably that of New York, shows how rapidly a surplus against any contingency is being built. This having been accomplished there are three ways in which such an organization may expand: first, by lessening the premiums — the premiums are, however, already within the reach of all; second, by increasing the service — the service is already adequate, with many comforts thrown in; third, by lessening some of the restrictions which are at present thrown around its membership. This last would seem to be the way of expansion for an organization whose whole purpose is to supply in a painless way the hospital needs of the people.

The newer part of this program calls, in part, for the immediate creation of an insurance system which, for a small premium, will meet the policyholder's doctor's bill. This latter system might very well be set up on much the same basis as that of the Associated Hospital Service Corporation. It should, however, be a distinct organization. It should preferably be non-profit, with the policyholder getting the benefit of whatever earnings the organization shows above and beyond that surplus necessary to maintain its financial soundness.

And finally the program demands the formation of a health council in each community. This council should be made up of all those agencies having to do with the distribution of medical care — hospitals, nurses, doctors, welfare and health organizations and social-service units. This type of committee would be in the best position to study and to know local needs, and the manner and means by which the rest of the program can be made to fit those needs.

This program has the endorsement of the Massachusetts Medical Society, the American Medical Association, the American, Catholic, and Protestant hospital associations and their subsidiary affiliates.

Mr. Charles E. Gallagher*: This is a splendid program, Dr. Tighe. I like its simplicity, and its comprehensiveness. Your emphasis on health education is well placed. None of us laymen know enough, or think enough, of the means of preserving our health. I quite agree with you that this type of education should start in the impressionable days of childhood.

I like your thought that the poor man should be cared for as an individual by the doctor of his own choice. This is the kind of medical care I want, and I can desire no less for him.

That part of the program which provides the means by which those with moderate incomes may easily finance their medical needs is bound to have great public support. The alacrity with which the people have accepted the plan of the Associated Hospital Service Corporation and the practical way in which it is working out are, in my opinion, a fair index of how this second part of the program — indemnity against doctors' bills — will be received.

The formation of community health councils is a splendid idea. I can well understand that the problem of the distribution of medical care may vary as the community varies. Who is in a more favored position to know the specific medical needs of a particular community than those who are actually engaged in the work of distribution?

I like the program as a whole because it is an attempt to assist the average man to help himself. I like it because it involves a minimal administrative cost — a guarantee that most of the dollar spent will accrue to the interest of the person spending it. I like it because it maintains the intimate relation between doctor and patient, with the initiative of that doctor to excel encouraged rather than discouraged. I cannot help but contrast a program of this character with the compulsory sickness-insurance plan as proposed by certain governmental agencies. I see in this latter an inevitably high administrative cost and the creation of an enormous political bureaucracy. For my part, I should rather that politics and political methods be kept out of the care of the sick.

*Editor of the *Lowell Evening Leader*.

NOTICES

REMOVAL

Henry Boruchoff, M.D., announces the removal of his office to 192 Bay State Road, Boston.

Aaron Kaufman, M.D., announces the removal of his office to 395 Commonwealth Avenue, Boston.

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning, 10:00 to 12:30, there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. Neoplasms of various sorts are seen and discussed, and when there is an indication, are treated with radium or high-voltage x-ray. Physicians are invited to visit this clinic. They may bring patients for aid in diagnosis or may refer patients to the clinic following which a report will be returned to the referring physician. A limited number of beds are available for diagnostic study and for treatment.

MEDICAL CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 p. m. on Thursday, January 12, in the Amphitheater of the Peter Bent Brigham Hospital, Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic, Harvard Medical School and physician-in-chief, Peter Bent Brigham Hospital, will give a medical clinic. Practitioners and medical students are cordially invited to attend.

BOSTON CITY HOSPITAL

The monthly clinicopathological conference will be held at the Boston City Hospital on Wednesday, January 11, at 12 o'clock noon, in the Pathological Amphitheater.

Joseph E. Hallisey, M.D., *Secretary*,
Medical Staff.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held on Tuesday, January 10, at 8:15 p. m., in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance). Dr. E. Stanley Emery will preside.

PROGRAM

Presentation of cases.

The Role of Intubation in the Study and Treatment of the Small Intestine. Dr. W. Osler Abbott.

Medical students and physicians are cordially invited to attend.

ROBERT ZOLLINGER, M.D., *Secretary.*

BOSTON MEDICAL HISTORY CLUB

There will be a meeting of the Boston Medical History Club at the Boston Medical Library, 8 Fenway, Boston, Monday, January 9, at 8:15 p. m.

Dr. Edwin B. Dunphy will talk on "The Development of Our Knowledge of the Diseases of the Eye."

Members of the medical profession and other interested persons are cordially invited to attend.

PAUL D. WHITE, M.D., *President,*
BENJAMIN SPECTOR, M.D., *Secretary.*

SOUTH END MEDICAL CLUB

The next meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, January 17, at 12 o'clock noon.

Dr. Thomas H. Ham will speak on "Laboratory Procedures in Hospital Practice."

Physicians are cordially invited to attend.

JOHN B. HALL, M.D., *Secretary.*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JANUARY 9

MONDAY, JANUARY 9

*4 p. m. Physicians and medical students are cordially invited to attend a clinic presented by the medical, surgical and orthopedic services of the Infants' and Children's hospitals, in the amphitheater of the Children's Hospital.

*8:15 p. m. Boston Medical History Club, Boston Medical Library.

TUESDAY, JANUARY 10

*9-10 a. m. Joseph H. Pratt Diagnostic Hospital. "Clinical Value of Male Hormone Assays." Dr. C. H. Lawrence and Dr. A. C. Moulyn.

*10 a. m. - 12:30 p. m. Tumor clinic. Boston Dispensary.

*8:15 p. m. Harvard Medical Society. Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance).

WEDNESDAY, JANUARY 11

Eastern Section of the American Laryngological, Rhinological and Otological societies in conjunction with the New England Oto-Laryngological Society. Massachusetts General Hospital.

*9-10 a. m. Joseph H. Pratt Diagnostic Hospital. Hospital case presentation. Dr. S. J. Thannhauser.

*12 m. Clinicopathological conference. Children's Hospital amphitheater.

12 m. Boston City Hospital. Monthly clinicopathological conference, pathological amphitheater.

THURSDAY, JANUARY 12

8:30-9:30 a. m. Exchange visit, Surgical and Orthopedic Staffs of the Peter Bent Brigham and Children's hospitals, held this week at the Children's Hospital Surgical.

*9-10 a. m. Joseph H. Pratt Diagnostic Hospital. An Unknown Hereditary Dyscrasia of the Blood. Dr. H. G. Brugsch.

*3:30 p. m. Medical clinic at the Peter Bent Brigham Hospital.

FRIDAY, JANUARY 13

*9-10 a. m. Joseph H. Pratt Diagnostic Hospital. The Diagnostic Importance of Pain Referred from the Digestive Tract. Dr. C. M. Jones.

*10 a. m. - 12:30 p. m. Tumor clinic. Boston Dispensary.

SATURDAY, JANUARY 14

*9-10 a. m. Joseph H. Pratt Diagnostic Hospital. Hospital case presentation. Dr. S. J. Thannhauser.

*10 a. m. - 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian.

SUNDAY, JANUARY 15

4 p. m. Illustrated, public, health lecture, Faulkner Hospital, auditorium. "The Surgical Treatment of Stomach and Duodenal Ulcers." Dr. Edward L. Young, Jr.

4 p. m. Free public lecture, Harvard Medical School, amphitheater of Building D. "The Skin: What it does and the care it needs." Dr. C. Guy Lane.

*Open to the medical profession.

JANUARY 8 — Lecture at the Faulkner Hospital. Page 971, issue of December 15.

JANUARY 8 — Free Public Lecture, Harvard Medical School. Page 1056, issue of December 29.

JANUARY 8 — Beverly Hospital Public Health Lecture. Page 1056, issue of December 29.

JANUARY 9 — Boston Medical History Club. Notice above.

JANUARY 10 — Harvard Medical Society. Notice above.

JANUARY 11 — Boston City Hospital, monthly clinicopathological conference, pathological amphitheater. Page 41.

JANUARY 11 — Eastern Section of the American Laryngological, Rhinological and Otological societies in conjunction with the New England Oto-Laryngological Society. Massachusetts General Hospital.

JANUARY 12 — Pentucket Association of Physicians, 8:30 p. m., Hotel Bartlett, 95 Main Street, Haverhill.

JANUARY 12 — Peter Bent Brigham Hospital. Clinic conducted by Dr. Christian. Page 41.

JANUARY 17 — South End Medical Club. Notice above.

FEBRUARY 4, MAY 15 and 16 — American Board of Obstetrics and Gynecology. Page 451, issue of September 22. (*Application for admission to Group A examinations must be on file in the Secretary's office by March 15, instead of April 1 as previously stated.*)

MARCH 13 — Fourth Annual Postgraduate Institute. Page 938, issue of December 8.

MARCH 15, MAY 15, AUGUST 5 and OCTOBER 6 — American Board of Ophthalmology. Page 1013, issue of December 22.

MARCH 27-31 — American College of Physicians. Page 36, issue of July 7.

MAY 7-15 — International Congress of Military Medicine and Pharmacy. Page 501, issue of September 29.

MAY 15-16 — American Board of Obstetrics and Gynecology, Inc. Page 937, issue of December 8.

MAY 15-19 — American Medical Association, St. Louis, Missouri.

JUNE 6, 7, 8 — Massachusetts Medical Society. Worcester.

JUNE 26-29 — National Tuberculosis Association. Page 936, issue of December 8.

SEPTEMBER — Boston Psychoanalytic Institute. Page 450, issue of September 22.

SEPTEMBER 11-15 — American Congress on Obstetrics and Gynecology. Page 938, issue of December 8.

SEPTEMBER 15-28 — Pan-Pacific Surgical Association. Page 863, issue of November 24.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH

JANUARY 4 — Danvers State Hospital. Clinic at 5 p. m. Dinner at 7 p. m. Speaker: Dr. Kenneth J. Tillotson. Subject: The Psychiatrist's Viewpoint in Delinquency.

FEBRUARY 8 — Essex Sanatorium, Middleton. Clinic at 5 p. m. Dinner at 7 p. m. Speaker: Dr. Edward Churchill. Subject: Surgical Treatment of Pulmonary Suppuration.

MARCH 1 — Lynn Hospital. Clinic at 5 p. m. Dinner at 7 p. m. Speaker: Dr. John Rock. Subject: Endocrinology.

APRIL 5 — Addison Gilbert Hospital, Gloucester. Clinic at 5 p. m. Dinner at 7 p. m. Speaker: Dr. Ethan Allan Brown. Subject: Allergy.

MAY 10 — Annual meeting. Salem Country Club, Peabody.

SUFFOLK

JANUARY 25 — Symposium on Diabetes. Dr. Elliott P. Joslin and associates, Boston Medical Library, 8:15 p. m.

MARCH 29 — Joint meeting with New England Pediatric Society, Boston Medical Library, 8:15 p. m. Program and speakers to be announced.

APRIL 26 — Annual meeting in conjunction with Boston Medical Library, at 8:15 p. m. Election of officers. Program and speakers to be announced.

WORCESTER

JANUARY 11 — Page 1057, issue of December 29.

FEBRUARY 8 — Worcester State Hospital.

MARCH 8 — Worcester Memorial Hospital.

APRIL 12 — Worcester Hahnemann Hospital.

MAY 10 — Worcester Country Club — Annual meeting.

With the exception of the annual meeting in May, all the meetings begin with a supper at 6:30 p. m., which is followed at 7:30 p. m. by the business and scientific sessions.